SHANGHAI MUNICIPAL COUNCIL

PUBLIC HEALTH DEPARTMENT

REPORT

OF

COMMISSIONER OF PUBLIC HEALTH

1929

577-381

Shanghai Municipal Council

PUBLIC HEALTH DEPARTMENT

ANNUAL REPORT

1929

C. NOEL DAVIS, M.D., B.S. (LOND.),
D.P.H., D.T.M. & H. (Camb.)

Commissioner of Public Health

SHANGHAI:
PRINTED BY KELLY & WALSH, LIMITED, 30 FERRY ROAD.
1930.

A1088324

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STAFF OF PUBLIC HEALTH DEPARTMENT

Administration and Vital Statistics Division.

C. Noel Davis, M.D., B.S. (Lond.), D.P.H., D.T.M. & H. (Camb.)	*Commissioner of Public Health.*
J. H. Jordan, M.C., M.B. (Camb.), D.P.H. (Lond.)	*Deputy Commissioner of Public Health*
G. J. Turnbull, Cert. R.S.I.	*Departmental Secretary.*
J. S. Graham, A.R.S.I.	*Senior Clerical Assistant.*
W. D. Wells	*Clerical Assistant.*
G. R. Hunt	" "
C. N. Brown	" "
C. L. Hindson	" "
H. E. Aiers	" "
L. Larsen (Mrs.)	*Stenotypist.*
H. V. Starling	*Superintendent, Municipal Cemeteries.*

Laboratory Divison.

(PATHOLOGICAL.)

R. Cecil Robertson, M.C., M.D. (Glas.), D.P.H. (Edin.)	*Assistant Commissioner of Public Health.*
J. H. Blakelock, M.B., Ch.B.	*2nd Asst. Commissioner of Public Health.*
W. K. Dunscombe, M.D., B.S. (Durham), D.T.M. & H. (Eng.)	" " " "
A. E. P. Grimmo	*Senior Laboratory Assistant.*
A. H. Heather	*Laboratory Assistant.*
R. Baxter	" "
E. R. Davies	" "
C. H. Mahon	*Clerical Assistant.*
G. F. Jones	" "

(CHEMICAL.)

F. G. C. Walker, M.C., F.I.C., Ph.C.	*Chief Analyst.*
E. O. Wilson, Ph.C.	*Assistant Analyst.*
A. Fanthorpe, M.P.S.	*Pharmacist.*
L. H. Barton, Ph.C.	"

Hospital Division.

E. F. Duck, M.B., B.S., D.P.H. (Lond.), M.R.C.S., L.R.C.P. (Lond.)	*Assistant Commissioner of Public Health.*
H. Smith, M.B., B.Ch. (Camb.), M.R.C.S. (Lond.), L.R.C.P. (Eng.)	*2nd Asst. Commissioner of Public Health.*
J. E. Bowen, M.B., Ch.B. (N.U.I.), D.P.H. (Lond.), D.M.R.E. (Camb.)	*Assistant Commissioner of Public Health.*
G. Chambers, M.B., Ch.B. (Leeds), D.M.R.E. (Camb.)	*2nd Asst. Commissioner of Public Health.*
W. K. Miau, M.D. (Foochow Medical School)	*Senior Assistant Medical Officer.*
L. C. Tseu, M.D. (Pei-Yang)	*Assistant Medical Officer.*
J. T. Kuo, M.D. (Fukien Union)	" " "
F. D. Zau, M.D. (St. Johns)	" " "
Z. Z. Nyi, M.D. (St. Johns)	" " "
S. K. Ting, M.D. (St. Johns)	" " "
K. L. Chen, M.D. (Shantung Christian University)	" " "
H. M. Chang, M.D. (Pei-Yang)	" " "
C. L. Wong, M.D. (St. Johns)	" " "
W. D. P. Lieu, M.D. (St. Johns)	" " "
K. W. J. Lieu, M.D. (St. Johns)	" " "
Y. J. Cieh, M.R.C.S. (Eng.), L.R.C.P. (Lond.)	*Part-time Assistant in V. D. Clinic and Lecturer in First Aid to Chinese Police Force, etc.*

Hospital Division—cont.

M. I. Peake (Miss)	*Stenotypist.*
Miss L. M. Dawson	*Senior Matron, Isolation Hospital.*
„ A. M. Stillwell	*Matron, Isolation Hospital for Chinese.*
„ A. A. Thomlinson	*Matron, Chinese Police Hospital.*
„ E. L. Warren	*Assistant Matron, Indian Police Hospital.*
Mrs. M. Garton-Stone	*Matron, Boone Road Quarters.*
„ E. Gould	*Assistant Matron, Mokanshan Sanatorium.*
Miss E. Towner	*Assistant Matron, Tuberculosis Sanatorium.*
„ J. M. Martin	*Assistant Matron (Reserve).*
„ A. Z. Davies	*Assistant Matron, Mental Hospital.*
„ A. Reid	*Nurse-in-charge, King's Daughters Convalescent Home.*
„ A. M. Birks	*Nurse.*
„ M. Johnston	„ *(detached).*
„ E. A. Bursell	„
„ B. M. Daly	„
„ A. Campbell	„
„ M. G. W. Scott	„
„ I. B. Scott	„
„ J. Rennie	„ *(detached).*
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„ L. White	„
„ F. M. McGougan	„
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„ I. Moir	„
„ I. M. Holmes	„
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„ E. Edmundson	„
„ J. M. Lister	„
„ C. E. Welch	„
„ M. Milne	„
„ G. H. Udaka	„
„ S. Kanamoto	„
„ T. Ito	„
„ Y. Kodera	„
„ F. B. Lubeck	*Assistant Nurse.*
„ M. M. McLeavy	„ „
„ C. G. B. Poumbura	„ „
„ F. Korotkoff	„ „
„ A. N. Philipoff	„ „
„ P. E. Johnstone	*Probationer Nurse.*
„ V. Efimova	„ „
„ C. Minford	„ „
„ J. Goldman	„ „
„ L. Potanin	„ „
G. H. Flatt	*Male Mental Ward Attendant.*
R. C. Hillman	„ „ „ „
C. R. West	„ „ „ „
A. I. Kouznetsoff	*Male Nurse, V. D. Clinic.*
F. F. Cherepanoff	*2nd Male Nurse, V. D. Clinic.*
C. S. Marissoff	*Interpreter, V. D. Clinic.*

STAFF OF PUBLIC HEALTH DEPARTMENT.—cont.

Hospital Division.—cont.

V. Lavrooshka	*Dresser, Amoy Road Gaol.*
Miss L. A. Blakeley	*Visiting Nurse, T. B. Clinic.*
V. Songaillo	*Visiting Inspector, T. B. Clinic.*
W. Palmer	*Custodian, Isolation Hospital.*

Food, Dairies, Markets and Sanitation Divisions.

E. Kilner, M.R.S.I., M.S.I.A.	*Senior Chief Health Inspector.*
Miss C. V. Riley	*Stenotypist.*
D. Heathcote, M.R.S.I.	*Chief Health Inspector.*
F. W. Ambrose, M.R.S.I., M.S.I.A.	" " "
H. G. Brewster-Gow, M.R.S.I., M.S.I.A.	" " "
P. Veit, M.R.S.I., M.S.I.A., Dipl. I.H.	" " "
J. E. Fensham, M.R.S.I.	*Deputy Chief Health Inspector.*
A. W. Allan, A.R.S.I.	*Inspector.*
G. H. Bloom, A.R.S.I., M.S.I.A.	"
C. N. Bogomoloff, Cert. R.S.I.	"
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W. H. Chambers	"
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G. B. Marsh	"
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W. W. Michailoff, Cert. R.S.I.	"
I. J. Millership	"
S. Murakami	"
P. S. Page, Cert. R.S.I.	"
M. Pearce, A.R.S.I.	"
A. O. Pickel, A.R.S.I.	"
V. W. Ribbons	"
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W. J. Silvey	"
E. J. Sluis, Cert. R.S.I.	"
J. A. Stoddart, A.R.S.I.	"
B. Stone	"
E. T. Sundblad, Cert. R.S.I.	"
H. Taylor, M.S.I.A.	"
W. G. Watton, A.R.S.I.	"
R. G. Watts	"
J. Weaver	"
W. C. A. Wolnizer	"
H. J. F. Woolley, A.R.S.I.	"
P. B. Anderson	*Sanitary Overseer.*
O. Hirano	" "
W. Koteneff	" "
C. Mingozzi	" "
H. W. Noble	" "
A. N. Philipoff	" "
E. A. Roche	" "
B. A. Vouich	" "

REPORT OF THE COMMISSIONER OF PUBLIC HEALTH.

The year 1929 was noteworthy from the point of view of Public Health on account of serious epidemics of Cerebrospinal Fever and Cholera.

Cerebrospinal Fever was first reported in Shanghai in 1918. It was prevalent in 1920, since when sporadic cases have occurred yearly at all seasons.

Early in March 1929 it was reported that the disease had again broken out on the coast about twenty-five miles S.E. of Shanghai. It gradually spread over the eastern borders of Chekiang and Kiangsu to Shanghai and the surrounding districts. The disease became epidemic in the Settlement in April, and then rapidly declined until the end of July, after which only a few sporadic cases occurred. It was the severest outbreak ever experienced but the mortality was lower than in 1920 when it was last prevalent. Among Foreigners there were 88, and among Chinese 1,099 cases, including 20 cases among Foreign and 219 cases among Chinese non-residents, treated in Hospitals.

The death-rate was 48% among the foreign and 47% among the Chinese Community.

Epidemics are usually associated with conditions of over-crowding. No over-crowding—no epidemic of Cerebrospinal Fever. Specific prophylaxis by vaccine has been tried but its usefulness has not been established. Preventive measures, generally, resolve themselves into avoidance of over-crowding, especially within closed spaces, and in personal and social hygiene.

Cholera was known to occur in the Settlement as far back as the early sixties. In 1862 it was described as prevailing under "peculiarly unfavourable hygienic conditions," and caused a considerable mortality among both Foreigners and Chinese. Two hundred British soldiers died that year, in two Regiments of the Line, and one third of the crew of H.M.S. "Euryalus" was prostrated, twenty men and two officers dying in one day. In the following July, fifteen hundred Chinese were said to have died in one day.

In 1873 Cholera was reported to be prevalent in Bangkok and Singapore, and fear arose of a possible extension to Shanghai. General measures of sanitation of the environment were carried out but no special measures of personal and social hygiene.

The disease has been endemic in China from time immemorial and reappears regularly year after year. It usually starts in the south and spreads northwards along trade routes and lines of travel by sea, and along inland waterways.

The endemicity of Cholera in China is a subject of great importance from the point of view of prevention, and well worthy of epidemiological study.

During recent years serious outbreaks have occurred in 1907, 1912, 1919, 1926 and 1929. The last outbreak was the severest for ten years, but the mortality considerably lower than in 1926 when the disease was last epidemic.

Cholera was reported to be present in several of the coastal towns of S. China during 1929, and first appeared in the Settlement in July. The first case among the Chinese was notified early that month and the diagnosis was quickly confirmed in the Municipal Laboratory. The peak was reached in the middle of August and the last case recorded early in November. Among the Chinese there were 3,513 cases and 307 deaths; more than half of these came from the surrounding Chinese districts; among Foreigners there were 58 cases and 6 deaths.

The prevention of Cholera in a great port, with world-wide communications, is a problem of international importance. In broad terms, the first line of defence is in the sanitation of the environment and the hygiene of the person; the second line of defence is the immunisation of the person by specific inoculation.

In places like Shanghai, which are under the control of more than one authority, the completest practical co-operation between these Authorities is necessary in making the essential preventive measures efficient.

Such measures are:—

1. Education and Publicity.
2. Provision and maintenance of pure food and water supplies.
3. Safe and efficient systems of sewage and refuse disposal.
4. Prevention of breeding and the destruction of flies.
5. Control of traffic by land and water.
6. Effective maritime quarantine.
7. Diagnosis, notification, isolation and treatment of cases.
8. Control of contacts and carriers.
9. Disinfection of infected material.
10. Satisfactory disposal of the dead.
11. Provision, when necessary, of free prophylactic inoculation.

Smallpox was known in China long before the Christian era, and is described in books still extant. For centuries it was one of the greatest scourges, depopulating cities and exterminating nations. It is the typical preventable disease and vaccination is the typical method of specific prophylaxis. Vaccination protects from Smallpox as much as that disease itself.

"I never expected that it would do more" said Jenner in 1798, "and it will not, I believe, do less."

Vaccination was introduced into Canton in 1805, shortly after Jenner's great discovery, and was first performed in Shanghai in 1846 by Dr. Lockhart of the Shantung Road Hospital. A Municipal Vaccination Dispensary was opened in the Maloo in 1871 by Dr. Edward Henderson. During that year 258 children were vaccinated, and since then well over half a million free vaccinations have been done by the Public Health Department.

This year the number was 58,213, which constitutes a record. It is estimated that about 75% of the new born babies in the Settlement are protected each year against Smallpox by vaccination. The efficacy of vaccination in the prevention of the disease has been proved by the accumulated experience of a hundred and thirty years.

During the present year there were 21 deaths from Smallpox among Foreigners, and 165 among the Chinese in the Settlement.

At the end of the year Shanghai was visited by Dr. L. Rajchman, Director of the Health Section of the League of Nations, and his colleague Dr. Frank G. Boudreau, who were on a mission to the Ministry of Health at Nanking. A valuable discussion of an informal nature was arranged by the Minister of Health in which Dr. Rajchman and Dr. Boudreau and a number of Foreign and Chinese Public Health officials took part, with a view to joint action in the prevention of Cholera and other communicable diseases in Shanghai.

It is impossible to estimate too highly the value of the undertakings and achievements of the League of Nations in International Hygiene. Investigations have been made into the cause and spread of pandemics and the world-wide incidence of disease. International Commissions have been established for research into Malaria, Leprosy, Sleeping Sickness, Tuberculosis, Rickets, Syphilis, Cancer and Smallpox.

The Health Section, Eastern Bureau, established at Singapore in 1926 has steadily increased its activities and is of inestimable value to international health and commerce. Under the aegis of the League of Nations the outlook for Public Health in China is full of hope and promise.

Seventy years ago, in 1860, the rudiments of a Public Health Department existed in the Foreign Settlement of Shanghai. It was then called the Nuisance Department and its chief function was the oversight of the collection and disposal of ordure and garbage. The cost to the community was about $6,000 a year.

The Department was established on modern lines, in 1898, by Dr. Arthur Stanley, who was the first whole-time Health Officer. Since then it has undergone steady progressive development and its achievements have been accomplished, not by compulsion, for there is an almost complete lack of Public Health legislation in the Settlement, but by educative tact and persuasion, and by the commonsense, goodwill and enlightened co-operation of the people.

Nevertheless, on account of the continuous growth and increasing complexity of the city, and because the control and suppression of communicable and epidemic diseases depends fundamentally on accurate knowledge of their origin and prevalence, and on power to deal promptly and effectively with conditions that favour the spread of such diseases, the need becomes more and more urgent for a complete code of Public Health legislation, dealing among other matters with:—

1. Compulsory registration of Medical Practitioners.
2. Compulsory notification of communicable disease and registration of deaths.
3. Compulsory isolation of cases of communicable disease, where means of isolation in the home are inadequate or undesirable.
4. Prevention of over-crowding.

The Department's scope and activities, to-day, are wide-reaching and comprehensive, and its organisation embraces the following Divisions:—

Administration, concerned with the control of all business matters, expenditure and income, vital statistics, registration of communicable diseases and of deaths among Foreigners, also the control of Foreign Cemeteries.

The *Pathological Laboratory* for the diagnosis of communicable disease; the bacteriological examination of water, milk and food; the preparation of Smallpox vaccine, and other vaccines; the examination of rats for Plague.

The *Pasteur Institute* for anti-rabic treatment.

The *Chemical Laboratory* for the analysis of water, milk and food; toxicological and forensic examinations.

Hospitals.—Foreign and Chinese Isolation Hospitals; Indian and Chinese Police Hospitals, Mental Hospital; Tuberculosis Sanatorium; Tuberculosis Clinic; Venereal Diseases Clinic and a Radiological Department. Medical Services for the Municipal Gaols for Foreigners and Chinese.

Ambulance Service of six motor ambulances.

Disinfection Station and Public Mortuary.

Food, Dairies and Markets Division for the supervision, inspection and control of licensed premises as Hotels, Restaurants, Bakeries, Confectioneries, Dairies, Markets and Slaughterhouses.

Sanitation Division for the investigation of cases of communicable disease; disinfection, verification of causes of death; vaccination, prevention of flies and mosquitoes; prevention of plague, sanitary inspection of premises including laundries, tailors' shops and lodging houses, control of offensive trade, the remedying of public nuisances; administration of the public swimming bath and open air pool.

Publicity.—The preparation and circulation of Public Health educational notices and pamphlets in English, Chinese, Japanese, and Russian; lectures and cinematographic demonstrations on matters of Public Health.

Since Shanghai is becoming more and more the permanent dwelling-place for thousands of Foreigners and hundreds of thousands of Chinese, there is a growing need for public health services for Maternity, Child Welfare, Medical Inspection of Schools and Industrial Hygiene.

At the present time about one million dollars a year are spent in the Foreign Settlement on Public Health, and this works out at approximately one dollar a head.

The cost of a standard Public Health programme for a modern community is given as about five times that amount, and the Foreign Settlement should be spending five million dollars a year, while for the whole of China the yearly cost of an adequate Public Health service would be two milliard dollars.

The economic loss caused by preventable disease is incalculable. Money spent on the prevention of disease and the promotion of public health is undoubtedly a sound financial investment. Sir George Newman, the Chief Medical Officer of the Ministry of Health in England, who has done so much for the cause of Public Health, says:—"If a nation desires to secure a high measure of public health, it is obvious it must pay for it. Public Health is purchasable.....in a true sense a nation can buy health, but the goods are not delivered on the date of payment. Public Health expenditure on national health is like.....a long term investment, it yields its interest with absolute certainty, a thousand-fold, but only in the course of years, and sometimes only in the course of generations. It is money hidden in maternity, in good schools, in pure food, in clean streets, in sanitary houses, in an abundant water supply, in dispensaries, hospitals and sanatoriums.....its benefits are unappreciated until they are withdrawn, yet without this investment a nation is bankrupt."

Looking back over the achievements of medical research in the prevention of disease and the promotion of public health during the last fifty years, it is impossible not to see, in vision, beyond the horizon, the fulfilment of the old Greek ideal, a temperate people, beautifully developed in body, mind and spirit, fulfilling their natural faculties to the highest, and dwelling together in perfect harmony and joy, strong in courage and wisdom.

STATISTICAL SUMMARY.

SITUATION: Latitude 31° 15′ N.; LONGITUDE 121° 29′ E.

ELEVATION: Approximately sea-level.

AREA WITHIN MUNICIPAL LIMITS: 5,584 acres or 8 2/3 sq. miles.

DENSITY OF POPULATION WITHIN SETTLEMENT LIMITS:
155 persons per acre.

NUMBER OF INHABITED HOUSES:

	Within Limits.	*Outside Limits.**
Foreign	4,925	1,979
Chinese	72,305	3,547

POPULATION:

	International Settlement & Outlying Roads.
Foreign	32,885
Chinese	830,760

DEATH-RATE:

Foreign	18.9
Chinese	16.4

AVERAGE RAINFALL: 45 inches per annum.

*Houses on which rates are collected.

1.—METEOROLOGY OF SHANGHAI.

		January	February	March	April	May	June	July	August	September	October	November	December	Year 1929
Barometer	Mean Inches	30.336	30.274	30.186	30.014	29.877	29.688	29.702	29.699	29.944	30.122	30.283	30.263	30.032
	Departure from Average	+0.011	—0.001	+0.017	+0.010	+0.008	—0.040	+0.018	—0.013	+0.043	+0.016	+0.043	—0.048	+0.005
Temperature	Mean Degree	39°.14	38°.70	47°.44	58°.64	66°.34	74°.00	81°.48	81°.94	72°.64	63°.22	50°.86	42°.84	59°.77
	Departure from Average	+1.34	—0.70	+1.24	+2.36	+0.68	+0.64	+1.04	+1.52	—0.38	—0.08	—1.32	+0.68	+0.55
Daily range of Temperature	Mean Degree	13°.44	14°.76	20°.90	23°.26	19°.00	17°.30	15°.28	15°.40	20°.02	21°.24	19°.76	12°.19	17°.71
	Departure from Average	—1.04	+0.48	+5.42	+6.38	+0.80	+1.56	—0.38	—0.64	+4.16	+3.10	+1.86	—4.19	+1.46
Degree of Humidity	Mean (Saturation=100)	79.4	72.1	70.6	67.7	80.1	85.3	84.1	84.8	76.3	76.0	72.1	85.6	77.8
	Departure from Average	+1.0	—6.5	—8.2	—11.9	+0.7	+1.1	0.0	+0.7	—6.9	—3.1	—5.6	+9.5	—2.4
Rainfall	Amount in Inches	2.48	0.69	0.36	1.10	4.17	2.77	5.04	6.01	1.90	0.34	1.03	5.49	31.38
	Departure from Average	+0.48	—1.63	—3.08	—2.53	+0.62	—4.59	—0.82	+0.31	—3.04	—2.62	—0.98	+4.18	—13.70

The above figures have been kindly furnished for this report by The Acting Director, Siccawei Observatory.

II.—VITAL STATISTICS.

Foreign Population.

	Central	Northern	Eastern	Western	Outside Roads	Total
Census—1925	1,583	10,256	6,251	4,462	7,097	29,649
Estimated—1929	1,500	11,000	7,000	5,000	8,385	32,885

Chinese Population.

(*Excluding shipping and boats*).

	Central	Northern	Eastern	Western	Total
Census—1925	130,477	165,725	286,047	213,948	796,197
Estimated—1929	135,000	170,000	300,760	225,000	830,760

Deaths—Foreign.

Among Foreigners within the jurisdiction of the Shanghai Municipal Council 755 deaths occurred, 624 among residents and 131 among non-residents.

The death-rate was 18.98 a thousand, compared with 16.05 in 1928; excluding the Shanghai Defence Forces the death-rate was 18.52 compared with 15.53 in 1928.

The proportion of deaths among Asiatics other than Chinese, forming 52% of the population, was 62.3%, and of these 51.4% were Japanese who form 47% of the population.

The mean age at death was 28.4 years compared with 25.7 in 1928.

The mean age at death of adults, that is persons over 15 years of age, was 41.7 years compared with 40.2 in the previous year.

National Death Rates.

Nationality	Estimated mean resident population	No. of Deaths	Death rate per 1,000
American	1,765	25	14.2
British	6,064	70	11.5
do. (Indian)	1,247 } 7,311	57 } 127	45.7 } 17.4
Japanese	15,495	321	20.7
Portuguese	1,434	31	21.6
Russian	3,500	76	21.7
Others	3,380	44	13.0
Total	32,885	624	18.98

NAVAL AND MILITARY DEATHS IN THE INTERNATIONAL SETTLEMENT.

Cause of death	American		British		Italian	Japanese		Total	
	Resident	Non-res.	Resident	Non-res.	Non-res.	Resident	Non-res.	Resident	Non-resident
Paratyphoid fevers		1							1
Dysentery			2			1		3	
Pneumonia			1		1			1	1
Smallpox		1							1
Cerebrospinal fever	1		1					2	
Accidental		1				1		1	1
Other causes	2	2	6	1				8	3
	3	5	10	1	1	2		15	7

DEATHS—CHINESE.

Among an estimated mean population of 830,760, the deaths of 13,642 Chinese residents were recorded compared with 10,868 in 1928 and 9,966 in 1927. The death-rate was 16.42 a thousand compared with 13.2 and 12.3 in the two previous years. Of the total number of deaths 39% were among infants and children up to the age of 5 years.

Tables of analysis of both Foreign and Chinese deaths follow:—

DEATHS AMONG THE RESIDENT FOREIGN COMMUNITY 1929.

Cause of Death	January	February	March	April	May	June	July	August	September	October	November	December	Totals
Cholera	..	..	..	..	..	..	..	2	4	..	..	..	6
Typhoid Fever	1	1	..	..	..	2	3	1	6	6	4	2	26
Paratyphoid Fevers	..	..	..	..	..	..	..	..	1	..	..	..	1
Amœbic Dysentery	..	..	..	1	..	..	2	3	..	2	..	1	9
Bacillary Dysentery	1	..	..	..	1	..	..	4	4	3	1	..	14
Sprue	1	..	1	..	..	..	..	..	..	..	..	..	2
Diarrhoea	1	..	..	..	2	4	2	1	4	4	..	1	19
Pulmonary Tuberculosis	4	4	4	4	3	11	7	3	3	4	3	5	55
Tuberculous Meningitis	1	..	..	..	..	..	1	1	3	..	..	..	6
Tuberculosis(other forms)	..	2	1	1	..	1	..	..	2	..	2	1	10
Lobar Pneumonia	6	5	5	1	3	1	3	3	1	2	1	2	33
Bronchopneumonia	7	6	5	6	3	4	3	4	2	1	1	2	44
Influenza	2	1	2	..	1	..	..	..	..	..	..	..	6
Bronchitis	2	..	..	..	..	..	..	1	..	..	3	..	6
Smallpox	5	2	..	..	1	..	..	..	..	..	2	2	12
Diphtheria	..	1	..	1	..	..	..	..	..	..	..	1	3
Scarlet Fever	..	..	..	..	..	..	1	1	..	..	..	..	2
Measles	1	1	..	..	2	..	..	..	..	..	..	1	5
Whooping Cough	..	..	..	1	..	..	..	..	1	1	..	..	3
Cerebrospinal Fever	2	..	8	17	4	3	1	..	..	..	..	1	36
Meningitis (other forms)	..	2	3	..	1	..	..	..	1	..	1	1	9
Encephalitis Lethargica	..	..	..	..	..	..	..	..	2	..	..	..	2
Rabies	..	..	..	..	..	1	..	..	..	..	..	1	2
Plague	..	..	..	..	..	..	..	..	..	..	..	..	..
Tetanus	..	..	..	..	..	..	..	1	..	..	..	..	1
Anthrax	..	..	..	..	..	..	..	..	..	..	..	..	..
Typhus Fever	..	..	..	..	..	..	..	..	..	..	..	..	..
Malaria	..	..	..	..	..	..	..	..	..	..	..	..	..
Beri-beri	1	2	3	1	3	1	1	..	3	1	2	2	20
Syphilis	1	..	..	..	..	2	..	..	1	1	..	1	6
Septicaemia	1	..	1	1	1	2	1	..	..	..	..	2	9
Diseases of Heart	3	3	2	3	..	3	3	3	2	2	2	2	28
Aneurism	..	..	2	1	..	..	..	1	1	..	..	..	5
Angina Pectoris	..	..	..	..	..	..	..	..	..	..	..	..	..
Arterio-sclerosis	1	1	1	..	..	1	1	..	1	..	..	..	6
Cerebral Haemorrhage	1	1	1	1	4	..	4	2	5	2	..	4	25
Diabetes	..	..	..	1	..	1	1	..	..	..	..	..	3
Cancer	1	1	1	2	1	..	1	1	1	2	2	2	15
Alcoholism	..	..	..	2	1	2	3	1	..	3	3	..	15
Heatstroke	..	..	..	..	..	..	..	..	..	..	..	..	..
Accidental	1	..	1	..	..	..	..	1	1	1	1	1	7
Suicide	..	2	2	..	1	..	2	1	2	..	4	2	16
Senile Degeneration	2	2	2	1	1	..	3	1	1	1	..	2	16
Diseases of Liver	..	..	1	..	..	..	1	..	..	..	2	1	5
Diseases of Kidney	3	3	3	3	2	3	2	1	6	3	2	2	33
Marasmus	4	..	1	1	..	1	1	..	5	5	4	1	23
Other causes	4	6	10	8	3	6	10	6	10	2	4	11	80
Totals	57	46	60	57	38	49	57	43	73	46	44	54	624

DEATHS AMONG THE RESIDENT FOREIGN COMMUNITY—NATIONALITIES

Cause of Death	American	do. (Filipino)	British	do. (Chinese)	do. (Indian)	Czecho-Slav.	Danish	Dutch	Esthonian	Finnish	French	German	Greek	Iraqian	Italian	Japanese	Latvian	Norwegian	Persian	Polish	Portuguese	Russian	Spanish	Swedish	Turkish	Total
Cholera	..	..	..	..	1	..	..	..	1	..	..	..	..	..	..	3	..	..	..	1	..	..	..	..	..	6
Typhoid Fever	1	..	1	..	1	..	..	..	..	..	..	..	..	..	..	21	..	..	..	1	1	..	..	..	..	26
Paratyphoid Fevers	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	1
Amœbic Dysentery	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	6	..	..	..	..	1	2	..	..	..	9
Bacillary Dysentery	..	..	3	..	1	..	..	..	..	..	..	..	..	..	..	4	..	..	..	1	1	4	..	..	..	14
Sprue	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	2
Diarrhœa	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	16	..	..	..	..	1	1	..	..	..	19
Pulmonary Tuberculosis	1	1	2	..	15	..	..	..	..	..	..	..	..	..	..	23	..	..	..	..	5	7	..	1	..	55
Tuberculous Meningitis	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	4	..	..	..	..	..	1	..	..	..	6
Tuberculosis (other forms)	..	..	..	..	4	..	..	..	..	..	..	..	..	..	..	4	..	..	..	..	1	1	..	..	..	10
Lobar Pneumonia	1	..	7	..	1	..	..	1	..	..	..	1	..	..	1	17	..	..	..	..	..	3	..	..	1	33
Bronchopneumonia	..	..	3	..	7	..	..	1	..	..	..	..	..	..	..	31	..	..	..	..	..	2	..	..	..	44
Influenza	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	5	..	..	..	..	1	..	..	..	..	6
Bronchitis	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	4	..	..	..	..	..	1	..	..	..	6
Smallpox	1	..	2	1	1	..	..	..	..	..	..	..	..	..	..	5	..	..	..	1	..	1	..	..	..	12
Diphtheria	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	2	..	..	..	..	3
Scarlet Fever	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	1	..	..	..	..	2
Measles	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	4	..	..	..	..	..	..	..	..	..	5
Whooping Cough	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	3	..	..	..	..	..	..	..	..	..	3
Cerebrospinal Fever	1	3	5	..	6	..	..	..	..	..	..	..	1	..	1	17	..	..	1	..	..	1	..	..	..	36
Meningitis (other forms)	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	7	..	..	..	..	..	1	..	..	..	9
Encephalitis Lethargica	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	1	..	..	..	..	..	2
Rabies	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	2
Plague	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Tetanus	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	1
Anthrax	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Typhus Fever	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Malaria	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Beri-beri	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	20	..	..	..	..	..	..	..	..	..	20
Syphilis	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	4	..	..	..	..	1	1	..	..	..	6
Septicaemia	1	..	..	..	1	..	..	..	..	..	..	..	..	..	..	4	..	1	..	..	1	1	..	..	..	9
Diseases of Heart	4	..	8	..	..	..	..	..	..	..	..	..	..	..	..	9	2	..	..	..	2	3	..	..	..	28
Aneurism	..	..	2	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	1	1	..	..	..	5
Angina Pectoris	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Arterio-sclerosis	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	4	..	..	..	..	..	1	..	..	..	6
Cerebral Haemorrhage	1	..	2	..	2	..	..	..	..	..	1	2	1	..	..	13	..	..	..	..	1	2	..	..	..	25
Diabetes	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	1	..	..	..	3
Cancer	1	..	3	..	..	..	..	..	..	..	1	..	..	..	..	3	..	..	..	1	1	4	..	1	..	15
Alcoholism	..	..	3	..	1	..	..	..	2	1	..	..	..	..	..	..	..	..	..	..	..	8	..	..	..	15
Heatstroke	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Accidental	..	..	1	..	2	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	3	..	..	..	7
Suicide	1	..	7	..	..	..	..	..	..	..	..	1	..	..	..	1	..	..	..	..	..	6	..	..	..	16
Senile Degeneration	1	..	2	1	..	..	..	..	..	..	..	..	..	1	..	6	..	..	..	..	1	4	..	..	..	16
Diseases of Liver	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	2	..	..	..	..	..	2	..	..	..	5
Diseases of Kidney	1	..	4	..	..	..	..	..	..	..	..	1	..	..	1	19	..	..	1	..	3	3	..	..	..	33
Malnutrition	..	..	1	..	1	..	..	..	..	..	..	..	..	..	..	21	..	..	..	..	..	..	..	..	..	23
Other Causes	1	2	9	..	9	1	1	..	..	..	..	..	..	..	1	36	..	..	..	2	5	11	2	..	..	80
Total	18	7	68	2	57	1	2	2	3	1	3	6	2	1	4	321	2	1	2	9	31	76	2	2	1	624

TOTAL FOREIGN DEATHS 1929.

Cause of death	January	February	March	April	May	June	July	August	September	October	November	December	Totals
Cholera	..	..	..	..	..	..	..	2	4	..	..	..	6
Typhoid Fever	2	1	..	..	..	2	3	3	9	8	5	4	37
Paratyphoid Fevers	..	..	..	..	..	..	..	..	1	1	..	..	2
Amœbic Dysentery	1	..	..	1	..	..	2	4	..	2	..	1	11
Bacillary Dysentery	1	..	..	..	1	..	1	4	7	4	1	..	19
Sprue	1	..	1	..	..	1	..	..	..	..	..	..	3
Diarrhœa	1	..	..	..	2	7	3	1	4	4	..	1	23
Pulmonary Tuberculosis	5	5	8	5	4	12	9	4	3	7	4	6	72
Tuberculous Meningitis	1	..	..	..	..	..	1	1	3	..	..	..	6
Tuberculosis (other forms)	..	2	1	2	..	1	..	..	2	..	2	1	11
Lobar Pneumonia	9	6	6	1	4	1	3	3	2	2	1	2	40
Bronchopneumonia	7	6	5	8	3	4	4	5	2	1	1	2	48
Influenza	2	1	4	..	1	..	..	..	..	..	..	..	8
Bronchitis	2	..	..	..	..	..	1	1	..	..	3	..	7
Smallpox	7	3	1	..	2	1	..	..	..	..	4	3	21
Diphtheria	..	1	..	1	..	..	..	..	..	..	..	1	3
Scarlet Fever	..	..	..	..	..	..	1	2	..	1	..	1	5
Measles	1	1	..	..	2	..	..	..	..	..	..	1	5
Whooping Cough	..	..	..	1	..	..	..	..	1	1	..	..	3
Cerebrospinal Fever	2	..	10	20	4	3	1	..	..	..	1	1	42
Meningitis (other forms)	..	2	3	..	1	..	..	..	1	..	1	1	9
Encephalitis Lethargica	..	..	..	..	..	..	1	..	2	..	..	..	3
Rabies	..	..	..	..	..	1	..	..	..	..	..	1	2
Plague	..	..	..	..	..	..	..	..	..	..	..	..	..
Tetanus	..	..	..	..	..	..	..	1	..	..	..	..	1
Anthrax	..	..	..	..	..	..	..	..	..	..	..	..	..
Typhus Fever	..	..	..	1	..	..	..	..	..	..	..	..	1
Malaria	..	..	..	..	..	..	..	..	..	..	..	..	..
Beri-beri	1	2	4	1	3	1	1	..	3	1	2	2	21
Syphilis	1	..	..	..	..	2	2	..	1	1	..	3	10
Septicaemia	1	1	1	1	2	2	1	..	1	..	..	2	12
Diseases of Heart	4	3	2	3	1	3	4	3	2	2	3	3	33
Aneurism	..	..	2	1	..	..	..	1	1	..	..	..	5
Angina Pectoris	..	..	..	..	..	..	..	..	..	..	..	..	..
Arterio-sclerosis	1	1	1	..	..	1	1	..	1	..	..	..	6
Cerebral Hæmorrhage	1	1	1	1	4	..	4	2	5	2	..	4	25
Diabetes	1	..	..	1	..	1	1	..	..	..	..	..	4
Cancer	1	3	1	2	2	2	3	2	2	3	2	2	25
Alcoholism	..	..	..	2	1	2	3	1	..	3	3	..	15
Heatstroke	..	..	..	..	..	..	..	..	..	..	..	..	..
Accidental	1	1	2	2	1	..	..	2	1	1	1	1	13
Suicide	..	3	2	..	1	..	2	1	2	..	4	2	17
Senile Degeneration	2	2	2	1	1	..	3	1	1	1	..	2	16
Diseases of Liver	..	..	1	..	..	1	2	..	..	..	2	1	7
Diseases of Kidney	3	3	3	3	2	3	2	1	6	3	2	3	34
Marasmus	4	..	1	1	..	1	1	..	5	5	4	1	23
Other causes	4	9	12	12	3	9	12	7	10	6	5	12	101
Totals	67	57	74	71	45	61	72	52	82	59	51	64	755

DEATHS AMONG THE RESIDENT FOREIGN COMMUNITY—AGE PERIODS.

Cause of Death	Under 1 year.		1 to 5		6 to 15		16 to 25		26 to 35		36 to 45		46 to 55		56 to 65		66 to 75		Over 75 years		Totals	
	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	Male	Female
Cholera	..	..	..	..	..	..	..	..	2	..	4	..	..	..	..	..	..	..	..	..	6	..
Typhoid Fever	..	..	..	..	1	1	4	5	8	3	2	1	1	..	..	..	..	..	..	..	16	10
Paratyphoid Fevers	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1
Amoebic Dysentery	1	..	..	..	..	1	1	1	1	1	1	1	..	..	..	..	..	1	..	..	4	5
Bacillary Dysentery	..	1	2	3	1	..	1	..	1	..	..	1	1	..	..	1	..	1	1	..	7	7
Sprue	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	1	..	..	1	1
Diarrhoea	1	1	5	5	1	..	..	1	2	..	1	..	..	..	..	1	1	..	..	..	11	8
Pulmonary Tuberculosis	..	..	1	2	1	2	3	5	9	7	8	4	9	1	1	2	..	..	..	..	32	23
Tuberculous Meningitis	..	1	..	2	..	1	..	1	..	1	..	..	..	..	..	..	..	..	..	..	..	6
Tuberculosis (other forms)	..	..	1	1	1	..	1	2	1	..	1	..	1	..	1	..	..	..	..	..	7	3
Lobar Pneumonia	..	..	1	..	..	..	2	2	6	5	7	1	6	..	1	2	..	..	..	..	23	10
Bronchopneumonia	14	9	8	8	..	2	..	1	1	..	..	..	..	..	1	..	..	..	..	..	24	20
Influenza	3	..	..	..	..	..	..	..	..	2	..	..	..	..	1	..	..	..	..	..	4	2
Bronchitis	1	2	..	1	..	..	..	..	..	..	..	..	..	..	1	..	..	1	..	..	2	4
Smallpox	2	4	..	..	1	..	..	1	1	1	1	..	..	1	..	..	..	..	..	..	5	7
Diphtheria	..	..	2	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	2	1
Scarlet Fever	..	..	..	1	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	2
Measles	1	1	2	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	4	1
Whooping Cough	1	1	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	2
Cerebrospinal Fever	2	1	4	3	6	7	3	..	4	1	1	..	3	..	1	..	..	..	..	..	24	12
Meningitis (other forms)	1	1	2	1	..	1	..	1	..	1	..	1	..	..	..	..	..	..	..	..	3	6
Encephalitis Lethargica	..	..	..	..	..	..	..	..	..	1	1	..	..	..	..	..	..	..	..	..	1	1
Rabies	..	..	..	..	1	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	2	..
Plague	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Tetanus	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	1
Anthrax	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Typhus Fever	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Malaria	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Beri-beri	6	4	..	..	..	..	..	4	2	..	1	2	1	..	..	..	..	..	..	..	10	10
Syphilis	..	1	1	..	..	..	..	..	2	..	..	1	..	..	1	..	..	..	..	..	4	2
Septicaemia	..	..	..	..	..	..	..	2	1	1	2	2	1	..	..	..	..	..	..	..	4	5
Diseases of Heart	2	..	..	..	..	..	2	..	5	1	3	2	3	2	5	..	..	3	..	..	20	8
Aneurism	..	..	..	..	..	..	..	..	..	..	1	..	2	..	..	1	1	..	..	..	4	1
Angina Pectoris	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Arterio-sclerosis	..	..	..	..	..	..	..	..	..	..	1	..	..	..	3	2	..	..	..	..	4	2
Cerebral Haemorrhage	..	..	..	..	..	..	..	..	1	1	6	..	3	2	8	2	1	1	..	..	19	6
Diabetes	..	..	..	..	..	..	..	..	..	..	1	..	..	1	..	1	..	..	..	..	1	2
Cancer	..	..	..	..	..	..	1	..	..	3	..	1	3	2	3	..	1	1	..	..	8	7
Alcoholism	..	..	..	..	..	..	..	..	3	2	5	2	1	2	..	..	..	..	..	..	9	6
Heatstroke	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Accidental	..	1	..	..	..	..	..	1	4	..	1	..	..	..	..	..	..	..	..	..	5	2
Suicide	..	..	..	..	..	..	2	1	7	1	2	..	1	..	1	1	..	..	..	..	13	3
Senile Degeneration	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	1	2	2	10	4	12
Diseases of Liver	..	..	..	..	..	..	..	..	2	..	..	..	2	1	..	..	..	..	..	..	4	1
Diseases of Kidney	..	1	1	..	2	..	1	2	..	..	1	3	4	3	5	8	1	1	..	..	15	18
Marasmus	6	12	2	3	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	8	15
Other causes	17	9	1	7	1	2	3	6	4	10	4	3	5	3	2	..	..	3	..	..	37	43
Totals	58	50	33	39	16	18	25	36	67	44	56	25	48	18	36	21	6	15	3	10	348	276
Grand Totals	108		72		34		61		111		81		66		57		21		13		624	
Percentage of total deaths	17		12		5		10		18		13		11		9		3		2		100	

Mean Age at death=28.4 Mean Age at death of Adults=41.7

DEATH-RATE FROM 1880.

Year	Foreigners					Chinese
	Deaths			Estimated population	Death-rate	Death rate of Chinese population
	Adults	Children	Total			
1880	48	7	55	2,195	**25**	
1881	47	13	60	2,492	**24**	
1882	36	23	59	2,789	**21·2**	
1883	56	17	73	3,082	**23·7**	
1884	27	22	49	3,377	**14·5**	
1885	51	20	71	3,673	**19·3**	
1886	51	18	69	3,702	**18·6**	
1887	64	20	84	3,731	**22·5**	
1888	52	23	75	3,760	**19·9**	
1889	39	28	67	3,789	**17·7**	
1890	60	31	91	3,821	**23·8**	
1891	61	38	98	3,980	**24·6**	
1892	52	18	70	4,140	**16·9**	
1893	45	21	66	4,310	**15·3**	
1894	47	40	87	4,500	**19·3**	
1895	45	35	80	4,684	**17·1**	
1896	59	29	88	4,834	**18·2**	
1897	42	27	69	4,909	**14·5**	
1898	61	24	85	5,240	**16·2**	
1899	75	29	104	5,510	**18·9**	
1900	81	16	97	6,774	**14·3**	
1901	91	37	128	7,000	**18·3**	
1902	81	57	138	7,600	**18·1**	30.9
1903	86	46	132	8,300	**15·9**	21.2
1904	76	40	116	9,000	**12·9**	19.2
1905	96	33	129	11,497	**11·2**	14.2
1906	109	37	146	11,904	**12·3**	12.3
1907	153	92	245	12,311	**19·9**	21.9
1908	159	72	231	12,718	**18·2**	17.2
1909	149	102	251	13,125	**18·1**	17.3
1910	189	85	274	13,536	**20·2**	17.5
1911	158	73	231	14,532	**15·9**	13.8
1912	192	102	294	15,529	**18·9**	19.3
1913	204	103	307	16,525	**18·6**	15.8
1914	205	110	315	17,522	**18·0**	16.2
1915	199	86	285	18,519	**15·4**	13.2
1916	203	63	266	19,050	**14·0**	13.0
1917	241	169	410	19,750	**20·7**	14.9
1918	219	129	348	21,000	**16·5**	12.8
1919	322	131	453	22,000	**20·6**	14.3
1920	243	113	356	23,307	**15·2**	11.2
1921	283	154	437	24,000	**18·2**	11.0
1922	235	125	400	20,750*	**19·3**	11.7
1923	235	156	360	20,825	**17·2**	10.3
1924	209	161	370	21,657	**17·1**	11.2
1925	326	154	480	29,265	**16·4**	11.2
1926	356	259	615	30,565	**20·1**	15.3
1927	332	140	472	31,610	**14·9**	12.3
1928	321	198	519	32,330	**16·1**	13.2
1929	414	210	624	32,885	**18·9**	16.4

*(*Decrease due to re-classification of population.)*

DEATHS FROM COMMUNICABLE DISEASES AMONG THE RESIDENT POPULATION FROM 1890.

Year	Smallpox		Cholera		Typhoid Fever		Diphtheria		Scarlet Fever		Tuberculosis (All forms)		Influenza		Cerebro-spinal Fever	
	Non-Chinese	Chinese	Non-Chinese	Chinese	Non-Chinese	Chinese	Non-Chinese	Chinese	Non-Chinese	Chinese	Non-Chinese	Chinese	Non-Chinese	Chinese	Non-Chinese	Chinese
1890	4	79	32		4		0		0		8					
1891	3	223	23		7		3		0		11					
1892	5	78	0		7		2		0		18					
1893	11	184	0		2		2		2		6					
1894	9	125	0		5		3		0		7					
1895	7	138	20		0		5		0		4					
1896	19	316	10		8		1		0		9					
1897	2	92	0		6		1		0		9					
1898	2	65	0		7		1		0		9					
1899	7	183	0		6		0		0		10					
1900	0	54	0		4		2		2		14					
1901	1	31	0		6		3		11		17					
1902	3	434	8		6		8		27	1,500	7					
1903	7	241	3	162	13		3		1	2	26					
1904	11	759	1	0	7		2		3	0	11					
1905	14	246	0	0	7		2		1	0	15					
1906	0	29	4	193	11		1		3	5	14					
1907	21	863	18	655	7		1	62	14	79	35	960				
1908	5	143	1	8	8		1	54	2	33	29	938				
1909	0	19	4	0	7		2	36	3	9	32	828				
1910	13	304	0	0	13		1	49	7	109	37	618				
1911	10	156	0	0	9		3	55	2	35	33	789				
1912	3	124	14	1,307	13		2	103	11	146	33	1,096				
1913	12	207	0	0	19		5	113	15	115	38	1,008				
1914	11	162	0	350	17		4	75	5	144	56	1,051				
1915	15	106	0	0	11		1	54	1	147	59	1,024				
1916	0	3	0	100	10		1	39	9	234	61	1,034				
1917	18	188	0	0	19		0	64	38	595	85	1,111				
1918	4	107	0	0	12		0	36	7	142	60	1,237	9	418	1	
1919	1	0	32	648	23		1	25	1	86	60	1,063	28	483	4	11
1920	0	0	2	142	30		1	61	0	103	28	1,070	8	160	8	68
1921	23	204	3	119	19		5	62	3	149	34	879	3	76	4	25
1922	10	230	1	100	30		1	53	3	149	38	870	2	98	4	8
1923	6	51	3	91	20	264	0	29	0	71	57	822	8	38	2	3
1924	6	92	0	0	10	283	4	25	3	75	59	867	8	35	1	6
1925	7	59	6	93	18	310	0	23	4	80	62	871	9	37	4	2
1926	12	169	7	366	27	397	2	105	22	576	63	1,127	9	48	2	6
1927	0	7	4	94	15	457	0	33	0	45	56	975	6	29	0	11
1928	20	139	0	6	16	446	2	39	1	70	75	871	2	49	3	17
1929	12	165	6	129	26	512	3	32	2	55	71	966	6	35	39	364

RETURN OF CHINESE DEATHS 1929.

Month		Smallpox	Scarlet Fever	Diphtheria	Tuberculosis	Leprosy	Influenza	Pneumonia	Cerebrospinal Fever	Encephalitis Lethargica	Measles	Cholera	Typhoid Fever	Paratyphoid Fever	Dysentery	Diarrhoea		Rabies	Anthrax	Plague	Typhus	Malaria	Relapsing Fever	Beri-beri	Other Causes	Total
																Acute	Chronic									
January		64	4	8	76	..	3	32	2	..	27	..	45	..	5	2	3	..	..	..	..	..	..	2	804	1077
February		33	3	4	60	..	8	38	6	..	10	..	35	..	..	1	2	..	..	..	..	..	..	1	855	1056
March		28	8	5	81	..	10	57	38	..	15	..	46	..	2	..	2	..	..	..	..	..	..	1	984	1277
April		17	10	5	96	..	9	32	154	..	15	..	34	..	3	..	5	..	..	..	..	..	..	..	903	1283
May		15	4	3	79	..	..	32	92	..	12	..	31	..	..	1	5	..	..	..	..	..	..	..	906	1180
June		3	9	3	80	..	..	30	32	..	15	..	33	..	2	11	9	..	..	..	..	..	..	3	831	1061
July		2	2	..	101	..	1	37	20	..	13	2	52	..	8	19	14	..	..	..	..	..	..	..	786	1057
August		..	3	..	115	..	1	31	9	..	5	92	56	..	26	78	32	..	..	..	1	2	..	2	1045	1498
September		..	3	..	86	..	..	39	3	..	10	34	50	..	27	61	46	2	..	..	..	3	..	2	1005	1371
October		..	4	..	71	..	1	21	..	..	2	1	52	..	12	14	23	1	..	..	..	..	..	3	766	971
November		1	2	3	6	1	..	25	3	..	5	..	38	..	6	4	8	..	..	..	..	..	..	1	746	908
December		2	3	1	56	..	2	14	5	..	22	..	40	..	2	3	4	..	..	..	..	3	..	..	746	903
Totals	1929	165	55	32	966	1	35	388	364	..	151	129	512	..	93	194	153	3	..	..	1	8	..	15	10,377	**13,642**
	1928	139	70	39	871	1	49	390	17	..	713	6	446	..	64	175	112	3	1	..	1	6	..	29	7,736	10,868
	1927	7	45	33	975	..	29	300	11	1	47	94	457	1	127	193	168	5	..	..	..	12	2	43		9,966
	1926	169	576	105	1127	3	48	155	6	1	375	366	397	8	260	348	379	1	1	..	1	14	1	44		12,326
	1925	59	80	23	871	..	37	8	2	..	62	93	310	..	125	156	218	2	3	..	..	1	1	25		8,936

Chinese population .. .. Mean—830,760

Death-rate among Chinese 16.42

TABLE SHOWING AGE DISTRIBUTION OF CHINESE DEATHS.

Age Periods	Districts																						Totals		Grand Total
	Central						Northern						Eastern						Western							
	Adults		Children		Infants		Adults		Children		Infants		Adults		Children		Infants		Adults		Children		Infants			
	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	Male	Female	
Under 1 year	..	..	..	..	79	58	..	..	..	..	250	336	..	..	..	..	935	1,025	..	..	..	..	263	245	1,527	1,664	3,191
1–5	..	..	92	78	..	..	..	..	79	80	..	..	..	..	620	602	..	..	..	..	316	313	..	..	1,107	1,073	2,180
6–10	..	..	22	24	..	..	..	..	25	24	..	..	..	..	115	106	..	..	..	..	54	51	..	..	216	205	421
11–14	..	..	16	11	..	..	..	..	13	10	..	..	..	..	48	60	..	..	..	..	30	31	..	..	107	112	219
15–20	50	29	..	..	..	..	34	55	..	..	..	..	123	191	..	..	..	..	64	79	..	..	..	..	271	354	625
21–30	127	52	..	..	..	..	96	91	..	..	..	..	341	356	..	..	..	..	186	205	..	..	..	..	750	704	1,454
31–40	121	55	..	..	..	..	87	75	..	..	..	..	323	223	..	..	..	..	178	164	..	..	..	..	709	517	1,226
41–50	119	57	..	..	..	..	114	63	..	..	..	..	334	176	..	..	..	..	201	110	..		..	..	768	406	1,174
51–60	112	48	..	..	..	..	117	83	..	..	..	..	331	205	..	..	..	..	217	145	..		..	..	777	481	1,258
over 60	100	76	..	..	..	..	153	156	..	..	..	..	464	462	..	..	..	..	235	248	..	..	..	..	952	942	1,894
Totals..	629	317	130	113	79	58	601	523	117	114	250	336	1,916	1,613	783	768	935	1,025	1,081	951	400	395	263	245	7,184	6,458	13,642
Death-rates	9.8						11.4						23.4						14.8						16.42		

CHINESE DEATHS.

AGE DISTRIBUTION.

Summary.

AGE PERIODS	Adults		Children		Infants		TOTALS		GRAND TOTAL
	M	F	M	F	M	F	Male	Female	
Under 1 year	..	..	..	..	1527	1664	1527	1664	3191
1—5	..	..	1107	1073	..	..	1107	1073	2180
6—10	..	..	216	205	..	..	216	205	421
11—14	..	..	107	112	..	..	107	112	219
15—20	271	354	..	..	..	..	271	354	625
21—30	750	704	..	..	..	..	750	704	1454
31—40	709	517	..	..	..	..	709	517	1226
41—50	768	406	..	..	..	..	768	406	1174
51—60	777	481	..	..	..	..	777	481	1258
over 60	952	942	..	..	..	..	952	942	1894
1929	4227	3404	1430	1390	1527	1664	7184	6458	13,642
1928	3648	2817	1171	1106	1075	1051	5894	4974	10,868

III.—COMMUNICABLE DISEASES.

MEDICAL PRACTITIONERS.

The scheme for the voluntary registration of Medical Practitioners, Dentists and Veterinary Surgeons, which was formally approved by the Council in November 1928, has not yet become effective. It is desirable to have the co-operation of the French Municipal Provisional Commission and this awaits certain rearrangements of its public health administration.

There are now 192 medical practitioners on the official list of the Public Health Department; nationalities are as follows:—

American	17	German	12
Austrian	5	Hungarian	3
Belgian	1	Italian	1
British	36	Japanese	55
Chinese	18	Norwegian	1
Czechoslovakian	1	Polish	2
Finnish	1	Portuguese	1
French	12	Russian	26

NOTIFICATION.

The following table shows the source of notification of Communicable Diseases concerning the 862 foreign cases recorded within the jurisdiction of the Shanghai Municipal Council, that is, within the International Settlement and on Municipal Roads:—

Medical Practitioners (voluntary)	204 —	24%
„ „ (on request)	30 —	3%
Through General and Country Hospitals (on request)	119 —	14%
Prepared from Death Certificates	82 —	9%
Japanese Consulate-General (voluntary)	146 —	17%
Military Authorities (voluntary)	109 —	13%
Municipal Hospitals	343 —	40%
	1,033 —	120%
Received from more than one source	171 —	20%
	862 —	100%

Fees paid for notification of Communicable Diseases amongst both Foreign and Chinese residents at the rate of Tls. 1 for each notification amounted to Tls. 1,294, made up as follows:—

Foreign cases			242
Chinese cases:			
Foreign doctors		64	
Chinese doctors	167		
„ „ (Cholera)	821	988	1,052
			Tls. 1,294

COMMUNICABLE DISEASES NOTIFIED AMONG THE FOREIGN COMMUNITY: 1929.

Disease	Jan.		Feb.		March		April		May		June		July		Aug.		Sept.		Oct.		Nov.		Dec.		Totals	
	R	A	R	A	R	A	R	A	R	A	R	A	R	A	R	A	R	A	R	A	R	A	R	A	R	A
Smallpox	18	14	9	4	5	6	0	2	4	1	1	2	0	0	0	1	0	0	1	0	4	3	5	2	47	35
Scarlet Fever	1	1	4	0	8	14	4	13	1	2	7	2	8	1	1	4	4	1	7	3	4	3	10	3	59	47
Diphtheria	1	4	3	0	8	5	10	4	3	0	2	2	3	0	1	0	3	2	5	3	9	6	7	3	55	29
Pulmonary Tuberculosis	10	4	8	5	11	5	10	5	8	1	18	3	12	7	9	7	11	4	10	7	5	5	10	6	122	59
Leprosy	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Influenza	2	0	3	0	2	0	2	1	5	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	16	1
Cerebrospinal Fever	3	0	1	1	26	6	24	10	7	0	1	1	3	0	0	0	1	0	0	0	1	1	1	1	68	20
Cholera	0	0	0	0	0	0	0	0	0	0	0	0	1	0	31	4	12	8	1	1	0	0	0	0	45	13
Typhoid Fever	2	2	2	0	2	0	3	1	4	0	9	0	8	5	11	2	18	9	13	8	18	8	12	5	102	40
Paratyphoid Fevers	1	0	0	0	1	0	0	0	1	0	2	1	0	0	2	0	2	2	2	2	1	2	3	0	15	7
Amoebic Dysentery	4	1	1	1	4	2	1	0	5	0	4	1	8	2	14	5	11	6	20	4	7	5	4	2	83	29
Bacillary Dysentery	3	0	1	0	2	0	0	0	3	2	6	1	6	0	19	5	45	21	18	1	7	4	2	6	112	40
Rabies	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1	0	2	0
Anthrax	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0
Plague	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Typhus Fever	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Relapsing Fever	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Beri-beri	1	0	2	0	3	0	0	0	4	0	1	0	1	0	0	0	3	0	2	0	2	0	3	0	22	0
Encephalitis Lethargica	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	2	0	0	0	0	0	0	0	2	1
Malaria	1	0	1	0	0	0	2	1	3	2	1	0	23	0	16	3	35	11	22	4	3	1	4	1	111	23
Totals	47	26	35	11	72	38	56	38	48	8	53	13	73	16	104	31	148	64	102	33	62	38	62	29	862	345

R = Resident of International Settlement (including outlying Municipal roads). A = Non-Resident.

Valuable co-operation concerning the notification of Communicable Disease and the certification of death was received from the following:—

Medical Practitioners
Japanese Consulate-General
Naval and Military Authorities

Hospitals:—
General, Country, Paulun,
Lester Chinese, St. Luke's, St. Elizabeth's,
Chinese Red Cross General,
Chinese Infectious Diseases,
Red Cross Summer Diseases, Shanghai Emergency,
Labourer's Emergency, Sacred Heart, and
Hongkew General Dispensary.

LIST OF NOTIFIABLE DISEASES.

The list at present includes:—

Smallpox	Cholera	Rabies
Scarlet Fever	Typhoid Fever	Anthrax
Diphtheria	Paratyphoid Fevers	Plague
Pulmonary Tuberculosis	Amoebic Dysentery	Typhus Fever
Leprosy	Bacillary Dysentery	Relapsing Fever
Influenza	Malaria	Encephalitis Lethargica
Cerebrospinal Fever		Beri-beri

HEALTH SECTION—LEAGUE OF NATIONS.

The exchange of health information continued between Shanghai (International Settlement and French Concession) and the Health Section, Eastern Bureau, League of Nations, Singapore. The incoming weekly Broadcast, which is received in code by the French Radio Station, is decoded and circulated by the Public Health Department to:—

The Health Department, French Municipal Council,
The Port Health Officer,
The Harbour Master.

BILLS OF HEALTH.

The number of original Bills of Health issued during the year was 328, and duplicates 53, compared with 267 and 55 respectively during the previous year.

INCIDENCE OF AND MORTALITY FROM COMMUNICABLE DISEASES.

Smallpox.

The moderate prevalence at the beginning of the year, gradually declined on the approach of the hot weather. No cases were recorded in August and September. The disease re-appeared in October and tended to increase gradually towards the end of the year.

There were 47 cases among foreign residents and 12 deaths, including one in a case which had been notified in the preceding year.

Nationalities:—		
American	3	(1 died)
American (Filipino)	2	
British	12	(2 died)
British (Indian)	8	(1 died)
French	1	
German	1	
Japanese	11	(5 died)
Latvian	1	
Polish	1	(1 died)
Portuguese	2	
Roumanian	1	
Russian	4	(1 died)
	47	(11 died)

History of Vaccination.	*Cases.*	*Deaths.*
Never vaccinated	21 (includes 3 vaccinated unsuccessfully)	9
Vaccinated in infancy	9	1
„ „ childhood	3	1
„ within 16 years	4	—
„ „ 6 „	—	—
„ „ 3 „	10	—
	47	11

There were 165 deaths altogether among the Chinese, compared with 7 in 1927, and 139 in 1928.

VACCINATION.

The number of free vaccinations carried out at the Branch Health Offices, chiefly of infants and young children, was 58,213; this exceeded last year's record by 11,155 (full details are given in Part VI—Sanitation). The total number of vaccinations performed by the staff of the Public Health Department was 72,790.

SCARLET FEVER.

Scarlet Fever was moderately prevalent throughout the year, there being 59 cases notified among resident foreigners, 31 being among children under the age of 15 years. Two cases were fatal, one Japanese, the other a Portuguese child.

Scarlet Fever first appeared in Shanghai in 1873, nearly sixty years ago, and as usually happens when a communicable disease falls upon virgin soil, intensification of the virus took place, and disease became virulent in type among the Chinese and also among Foreigners, the case-fatality arising to about 30% compared with a usual rate of about 3%.

Scarlet Fever is particularly frequent in children under five years of age, and about three-quarters of all cases occur under the age of ten.

From the years 1902-1917 the disease showed a marked quinquennial periodicity comparable to that observed in other places.

The last severe outbreak in Shanghai was in 1926, when the case-mortality in the Isolation Hospital was 14.6% among Foreigners, and 30.4% among the Chinese.

One reason for the higher case-fatality among the Chinese is that many cases were brought to Hospital in a moribund state.

The seasonal prevalence in Shanghai is during the Autumn, Winter and Spring, and the maximum seasonal incidence is usually in the Spring.

The disease is readily transmitted directly from person to person, but less readily than Measles and Smallpox, in the infective secretions sprayed from mouth, throat and nose. The most dangerous cases are the mild unrecognised ones, by whom the infection may unknowingly be spread. It may also be transmitted from infected articles, and from food and milk. The virus is resistant and clings persistently to clothing and other things.

A haemolytic streptococcus is now generally recognised as the cause of Scarlet Fever, and an antitoxin is increasingly used with success in the treatment of the disease.

As a preventive measure, passive immunity may be obtained by means of a small dose of concentrated antitoxin, and active immunity by a small dose of streptococcal vaccine and of diluted and modified streptococcal toxin.

These procedures are of great value for those who have been exposed to infection, and for those like doctors and nurses, who are in close contact with the disease.

In view of the chief mode of spread by close personal contact, the prevention of Scarlet Fever generally is largely a personal and social problem to be dealt with by measures of personal and social hygiene, and these depend on the enlightenment which comes by education through teaching and experience.

INCIDENCE OF SCARLET FEVER.

	Foreign cases notified among residents	MUNICIPAL ISOLATION HOSPITALS						Deaths Among Residents	
		Foreign			Chinese				
		Cases	Deaths	Case fatality	Cases	Deaths	Case fatality	Foreign	Chinese
1873		(Foreign Cases prior to 1905 isolated in General Hospital).	..	..	..	..	..	1	
1882			..	..	..	..	..	2	
1888			..	..	..	..	..	2	(See
1889			..	..	..	..	..	2	
1893			..	..	..	..	..	2	footnote)
1897	4		..	..	..	..	..	0	
1898	8		..	..	..	..	..	0	
1899	7		..	..	..	..	..	0	
1900	15		..	..	..	..	..	3	
1901	58		..	..	..	..	..	11	
1902	101		..	..	34	7	21	27	1,500
1903	6		..	..	7	0	0	1	2
1904	15		..	..	11	2	18	3	0
1905	5	11	0	0	1	0	0	1	0
1906	10	20	2	10	2	1	0	3	5
1907	58	70	12	17	43	7	16	14	79
1908	25	19	2	10	17	6	35	2	33
1909	9	7	2	29	16	2	12	3	9
1910	32	35	6	17	31	9	29	7	109
1911	15	22	3	14	25	7	28	2	35
1912	49	64	14	22	93	34	36	11	146
1913	32	56	11	20	113	32	28	15	115
1914	24	42	4	9	106	31	29	5	144
1915	15	38	1	3	89	22	25	1	147
1916	27	57	11	19	99	21	21	9	234
1917	113	153	40	26	209	50	24	38	595
1918	33	58	6	10.3	54	8	14.8	7	142
1919	19	23	1	4.3	22	4	18.2	1	86
1920	29	43	0	0	39	7	20.5	0	103
1921	28	43	3	7	60	19	31.6	3	149
1922	27	58	6	10.3	102	22	21.5	3	149
1923	11	41	0	0	43	10	23.1	0	71
1924	17	34	2	5.9	45	8	17.7	3	75
1925	46	70	5	7	71	17	24.0	4	80
1926	125	164	24	14.6	365	111	30.4	22	576
1927	40	57	1	1.7	62	8	13	0	45
1928	49	66	3	4.5	98	16	16.3	1	70
1929	59	101	5	5	130	29	22.2	2	55

NOTE:—Before 1902 the figures relating to Deaths are not regarded as sufficiently accurate to quote; but it may be assumed that Scarlet fever was either entirely absent or sporadic in its incidence.

DIPHTHERIA.

55 cases were notified among foreign residents and 3 young children died. 32 deaths were recorded among the Chinese.

TUBERCULOSIS.

The mortality among resident foreigners is shown in the following tables:—

	Nationality				Total
	Asiatics			Others	
	Filipino	Indian	Japanese		
Pulmonary Tuberculosis	1	15	23	16	55
Tuberculous Meningitis	—	1	4	1	6
Tuberculosis (other forms)	—	4	4	2	10
	1	20	31	19	71

	Ages			Total
	Infants under 1 yr.	Children under 15 yrs.	Adults	
Pulmonary Tuberculosis	—	6	49	55
Tuberculous Meningitis	1	3	2	6
Tuberculosis (other forms)	—	3	7	10
	1	12	58	71

There were 966 deaths amongst Chinese or 7% of the total number of deaths, and 41% of the total number of deaths among the Chinese from Communicable Diseases.

Notifications were received of 122 new cases of Pulmonary Tuberculosis among resident Foreigners and included:—Indian 36, Japanese 34, Portuguese 11, Russian 28, and 13 of other nationalities.

LEPROSY.

One death among the Chinese was reported, the case being that of a man who had been living in an isolated state in a straw hut on the outskirts of the Western district. In addition 5 cases were recorded amongst Chinese, 4 being untraced residents who had been attending the Hongkew General Dispensary.

INFLUENZA.

There were six deaths among foreign residents (5 Japanese and 1 Portuguese) and 16 cases were notified.

Among the Chinese community, 35 deaths were reported.

TYPHOID-PARATYPHOID GROUP.

Among foreign residents 27 deaths occurred from these diseases compared with 18 during the previous year; of these 22 were Japanese, of whom 15 had no known history of prophylactic inoculation.

Notifications were received of 102 cases of Typhoid and 15 of Paratyphoid Fever among Foreign residents.

The details are as follows:—

Nationality.	*Typhoid Fever.*		*Paratyphoid Fevers.*	
	Cases.	*Deaths.*	*Cases.*	*Deaths.*
American	7	1	2	—
British	19	1	2	—
British (Indian)	3	1	—	—
Japanese	53	21	8	1
Russian	7	—	2	—
Others	13	2	1	—
	102	26	15	1

Prophylactic Inoculation history.	*Typhoid Fever.*		*Paratyphoid Fevers.*	
	Cases.	*Deaths.*	*Cases.*	*Deaths.*
Never inoculated	66	16	9	1
Unknown	8	2	—	—
Within 2 years	20	7	3	—
Within 4 years	5	1	—	—
Within 6 years	1	—	3	—
Within 15 years	2	—	—	—
	102	26	15	1

Of the above cases 56% and 60% respectively, occurred among Asiatics other than Chinese.

There were 512 Chinese deaths reported compared with 446 in 1928.

CEREBROSPINAL FEVER.

A severe outbreak of Cerebrospinal Fever, which reached epidemic proportions in April, caused a heavy mortality among both Foreigners and Chinese.

The disease has been known to be present in Shanghai for the last eleven years, the first case being reported in 1918. During that year there was a considerable epidemic in Hongkong. In 1920 the disease was prevalent in Shanghai, the maximum incidence being in March and gradually declining till July, after which month no further case was reported that year. Since 1918 sporadic cases have occurred every year and at all seasons of the year.

An epidemiological study shows that the disease has been prevalent during the last two years on the borders of Kiangsu and Chekiang, whence it spread to become epidemic in Shanghai and the surrounding districts.

As far back as April last year there were rumours of a "mysterious infectious disease" in Chekiang, along the estuary of the Chientang River and Hangchow Bay.

The symptoms were said to resemble those of influenza and malaria, and death frequently occurred within a few days.

This disease seems to have continued moderately, in the same neighbourhood, during the summer, and to have become more prevalent again in the autumn, so that in

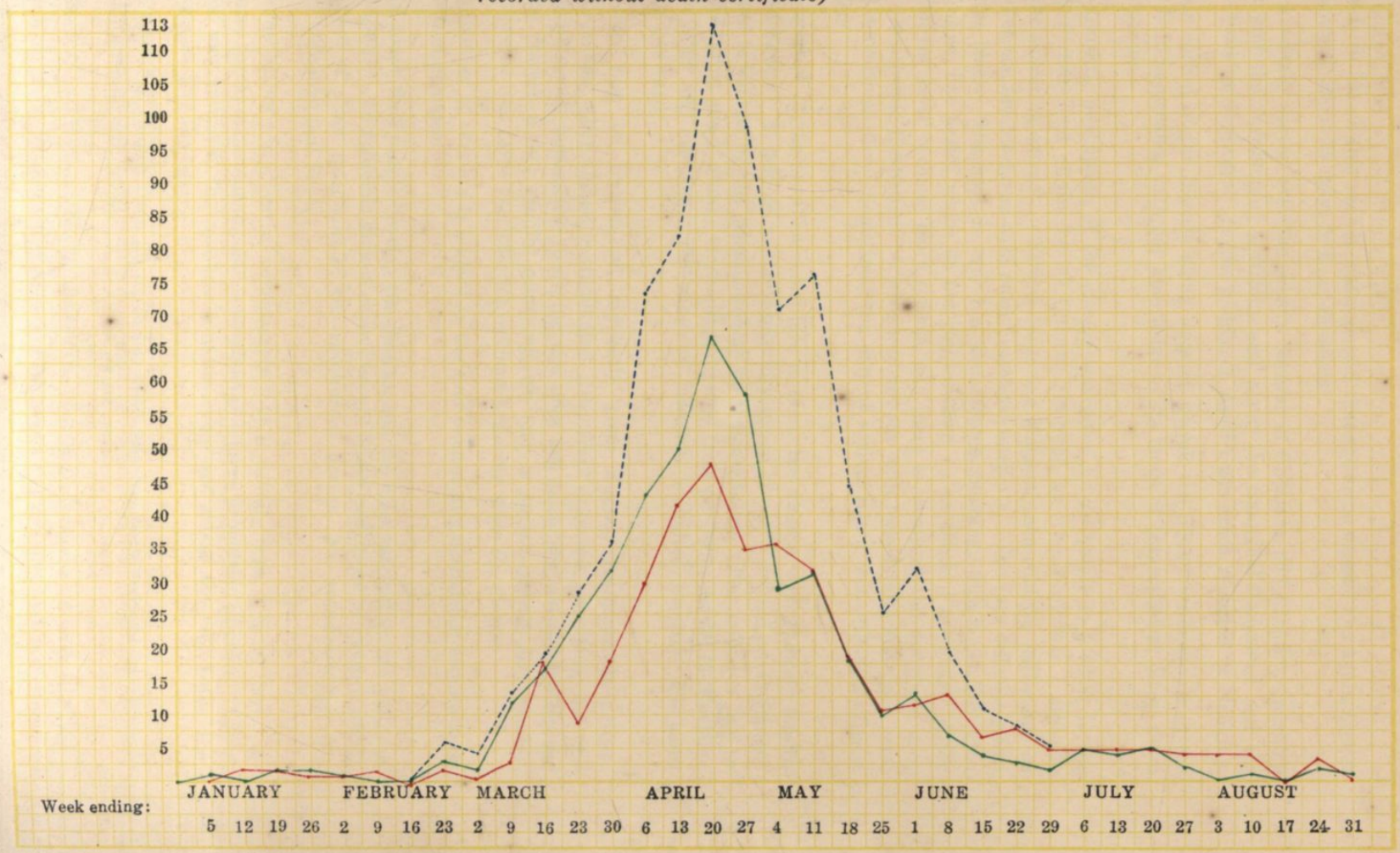
CEREBROSPINAL FEVER—1929. (up to 31 August)

Cases notified among Foreign and Chinese Residents = ——————

Deaths recorded „ „ „ „ = ——————

Cases, total „ „ „ „ = - - - - - - - - - - - -

(includes proportionate estimate covering deaths recorded without death certificate)



October it was reported that more than 3,000 people were ill and more than 1,000 had died.

Early in March this year it was reported that the same disease had again broken out on the coast, about 25 miles S. E. of Shanghai.

It gradually spread over the eastern corners of Chekiang and Kiangsu, including Shanghai and the surrounding districts, and along the Shanghai-Hangchow and the Shanghai-Nanking Railways. In the middle of April cases were reported in Nanking.

This spread of the disease along lines of travel, the inland waterways and the railways, is in accordance with our knowledge of its mode of transmission, direct from person to person.

A dramatic description of the disease was given by a Chinese in a letter to the Medical Superintendent of the Lester Chinese Hospital, by whose courtesy I am able to quote the following extract. "First a fever like Malaria, then cold for half a day or one day, then the fever returns with much increased intensity. The face becomes green and the lips black. The body is very hot like charcoal burning, with a peculiar kind of perspiration, like beads, which do not run together, so we think it is sticky. After perspiration the fever becomes more serious, and there is vomiting and diarrhoea once or twice. Meanwhile the patient becomes unconscious with locked jaws and open eyes, and after convulsions dies. Sometimes the patient revives again, but still dies after a little while."

On account of the eruption sometimes present, the disease was formerly known as "Spotted Fever." It belongs to the respiratory group of acute specific communicable diseases and is caused by the meningococcus of Weichselbaum. The infection lies in the nose and throat and is usually transmitted directly from person to person in expulsive acts as coughing and sneezing. The range of infection is limited, probably not more than one or two yards.

It may also be transmitted indirectly from fingers, food, utensils, toys, handkerchiefs and other things contaminated with fresh infected secretions, but the infection is extremely susceptible to drying and does not exist long outside the human being. The disease is not readily communicable and is spread mainly by "healthy carriers," persons who carry the infection without suffering from the disease.

The number of carriers is highest in the cold months and diminishes rapidly with the approach of summer.

Only susceptible people develop the disease, and the most susceptible are children and young adults. An epidemic almost always occurs under conditions of overcrowding, as in the case of other infections of the respiratory group. No over-crowding—No epidemic of Cerebrospinal Fever.

The incubation period varies considerably, but is usually from 2 to 10 days. A history of sore throat or "common cold" is obtained in a large proportion of cases. Later the infection may spread to the membranes of the brain and spinal cord, the lungs, the joints, the glands and the heart.

The mortality ranges from 20 to 75 per cent. but has been reduced by the use of specific anti-meningococcus serum to about 25 per cent.

Methods of prevention resolve themselves into the avoidance of overcrowding, especially within closed spaces, and in general hygiene.

The clinical and bacteriological aspects of the disease are dealt with in other sections of the Report. A special graph indicates the rise and fall of the epidemic, and

the following table gives a summary of the statistics of the disease as it occurred within the International Settlement.

Foreigners.	*Cases.*	*Deaths.*
Residents	68	36
Non-residents	20	6
Chinese.		
Residents	409	188
	383**	176*
	792	364
Non-residents	219	106
Totals	1,099	512

*Recorded without death certificate.
**Proportionate estimate of cases covering deaths recorded without medical certificate.

The following Notification was published and circulated in several languages when the disease became epidemic.

MUNICIPAL NOTIFICATION.

No. 3834.

CEREBROSPINAL FEVER. PREVENTION.

Personal Measures.

Owing to the prevalence of Cerebrospinal Fever in Shanghai and surrounding Chinese districts, the Commissioner of Public Health directs the attention of the Public to the following personal measures, the observance of which will assist in checking the spread of the disease:—

1.—Avoid proximity to persons suffering from colds and coughs.

2.—Use soft tissue paper handkerchiefs when sneezing, coughing or spitting, and burn after use.

3.—Avoid the stagnant, moist and germ-laden air of crowded meeting places.

4.—Protect children and young adults from risk of infection as far as possible, since they are most susceptible to the disease.

5.—Observe the hygiene of the throat and nose by using gargles, douches or sprays of mild antiseptic solutions.

The following are efficacious:—Half a teaspoonful of salt or a tablespoonful of compound glycerin of thymol, in a tumblerful of warm water.

6.—Cleanse thoroughly all food utensils in boiling water.

7.—Live in the sun and open air as much as possible, and in well-ventilated rooms.

8.—Adopt all measures which improve health and thereby assist in the general prevention of the disease.

9.—If suffering from fever, catarrh, sore- throat, headache or vomitting, go to bed and seek medical aid.

CHOLERA.

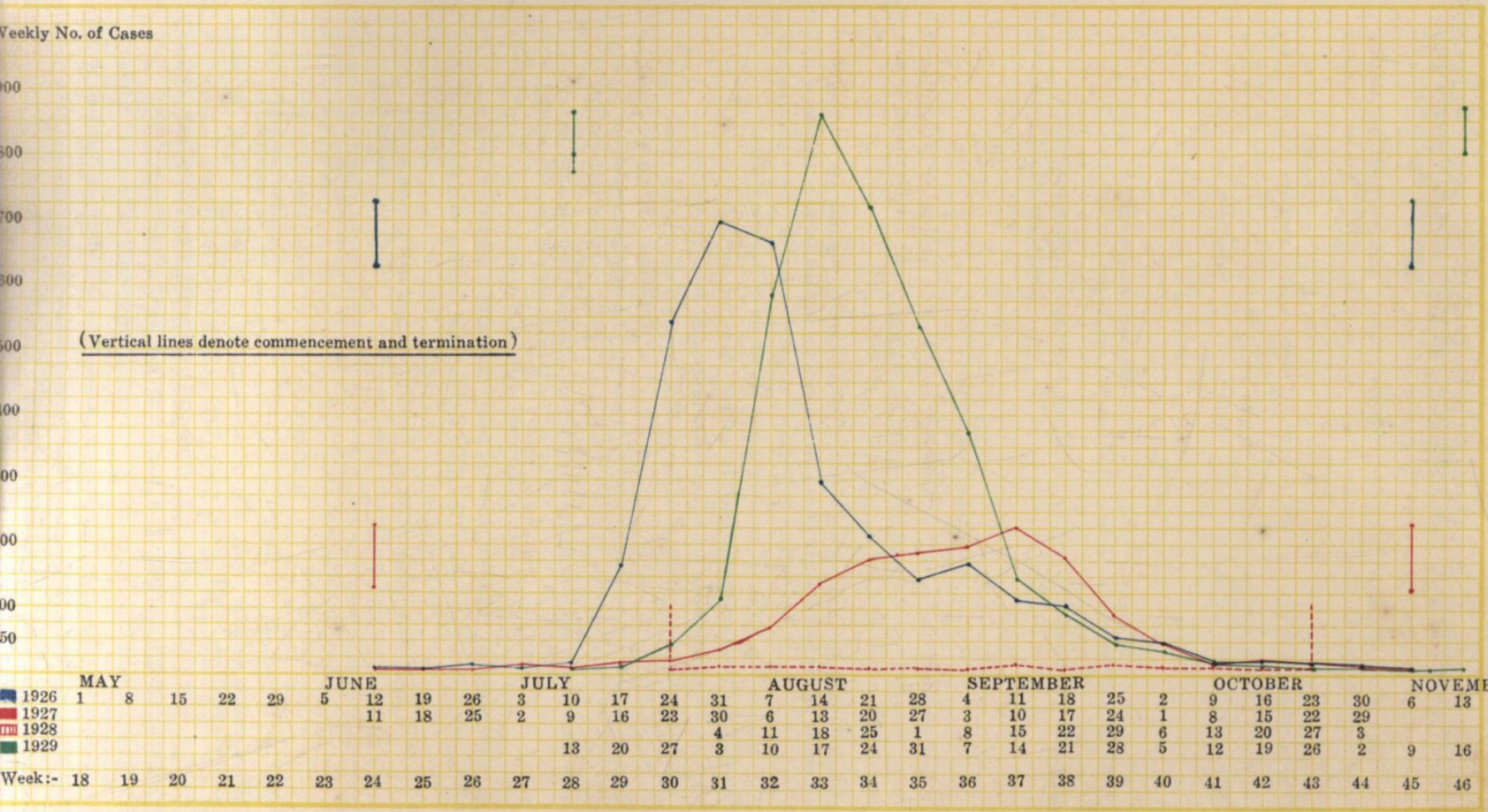
Epidemics of Cholera have occurred from time to time within the Settlement since its earliest days, the first being recorded in 1862. During recent years severe outbreaks of the disease occurred in 1907, 1912, 1919, 1926 and 1929. The epidemic of 1929 was the severest for the last ten years.

The disease was reported to be present in several coastal towns during June, appeared in the International Settlement for the first time in July, and reached epidemic proportions during August.

An epidemic may be defined in general terms as a wave of disease which, spreading widely, affects a large number of people, and is usually associated with mortality. Under

CASES OF CHOLERA NOTIFIED WITHIN INTERNATIONAL SETTLEMENT 1926-29.

(INCLUDING RESIDENTS & NON-RESIDENTS)



the Sanitary Regulations for the Port of Shanghai, a disease is said to be epidemic when an average number of three fresh cases occur daily for one week.

During the end of August the epidemic began to abate, and this continued steadily until November when, with the exception of one case notified among Chinese residents, Cholera was entirely absent from the Settlement.

The accompanying graph shows the course of the disease during the last five years.

Among Foreign residents, 45 cases occurred with 6 deaths.

	Cases.	*Deaths.*
Japanese	21	3
Russian	13	—
British (Indian)	7	1
British	1	—
Esthonian	1	1
Latvian	1	—
Polish	1	1
	45	6

Among resident Chinese 1,097 cases were notified with 93 deaths: in addition 36 deaths were recorded, without death certificate, by the staff of the Public Health Department, making altogether 129 deaths among the Chinese.

The following Hospitals within the Settlement, were open for the admission of cases of Cholera and other infective intestinal diseases during the summer months.

The Chinese Infectious Diseases Hospital,
Red Cross Summer Diseases Hospital,
Shanghai Emergency Hospital,
Labourers' Emergency Hospital and the
Municipal Isolation Hospital.

The majority of cases from the surrounding Chinese districts came from Chapei.

A summary of the statistics is given below:—

CHOLERA SUMMARY—1929.

	Notifications	Confirmations*	Deaths
FOREIGN			
International Settlement	45	33	6
French Concession	4	3	—
Surrounding Chinese districts	9	6	—
	58	42	6
CHINESE			93
International Settlement	1,097		36† 129
French Concession	405		51
Surrounding Chinese districts	2,011		127
	3,513	From 919 cases = 73 %	307

**Confirmed in Municipal Laboratory.*

(†Recorded without death certificate).

First Case—*Foreign* 30 July. *Chinese* 17 July.

Last „ —*Foreign* 20 October. *Chinese* 4 November.

During the epidemic period a special weekly return of Cholera was prepared and circulated to the following:—

The Commissioner of Customs.
The Port Health Officer.
The Health Department, French Municipal Council.
H.B.M. Consul-General.
The Consul-General for U.S.A.
The Consul-General for Japan.
The Consul-General for the Netherlands.
The Officer Commanding R.A.M.C.
The O.C. No. 7 British General Hospital.
The President, Japanese Medical Society.
United States Public Health Service.
The Medical Attaché, Japanese Consulate General.
The Ministry of Health, Nanking.

Public measures for the prevention of Cholera are the following, and in places like Shanghai in which the shipping and commercial interests are world-wide, and which are under the control of more than one authority, complete practical co-operation is necessary between the various authorities to make these measures efficient:—

1. Education and publicity.
2. Provision and maintenance of pure water and food supplies.
3. Safe and efficient systems of sewage and refuse disposal.
4. Prevention of breeding, and the destruction of flies.
5. Control of traffic by land and water.
6. Effective maritime quarantine.
7. Diagnosis, notification, isolation and treatment of cases.
8. Control of contacts and carriers.
9. Disinfection of infected material.
10. Satisfactory disposal of the dead.
11. Provision, when necessary, of free prophylactic inoculation.

In general terms the *first line of defence* is in the sanitation of the environment and the hygiene of the person.

The *second line of defence* is in immunisation of the person by specific prophylactic inoculation.

DYSENTERY.

Among resident Foreigners 195 cases were notified—compared with 234 in 1928 and 186 in 1927.

Nationalities and age distribution were:—

Nationality.	*Amoebic Dysentery.*		*Bacillary Dysentery.*	
	Cases.	*Deaths.*	*Cases.*	*Deaths.*
American	2	—	11	—
British	30	—	51	3
British (Indian)	—	—	9	1
Japanese	13	6	7	4
Russian	26	2	23	4
Others	12	1	11	2
Total	83	9	112	14
Children (under 15 years)	10	1	35	7
Adults	73	8	77	7

There were 9 fatal cases of Amoebic Dysentery and 14 of Bacillary Dysentery.

Among resident Chinese 93 deaths were recorded—compared with 64 in 1928 and 127 in 1927.

CHINESE CASES OF SUMMER DISEASES.

Hospital	IN-PATIENTS										OUT-PATIENTS	
	No. Admitted		No. discharged, cured		No. removed from Hospital, treatment incomplete		No. of Deaths		No. remaining in Hospital		No. of Cases treated	
	Settlement	O/S	Settlement	O/S	Settlement	O/S	Settlement	O/S	Settlement	O/S	Settlement	O/S
Red Cross Summer Diseases, Tientsin Road.	392	469	314	375	49	59	29	35	0	0	2,615	1,325
Chinese Infectious Diseases, Thibet Road.	804	2084	771	2003	0	0	33	81	0	0	4,200	8,477
Shanghai Emergency, North Thibet Road.	540	953	511	909	5	7	24	37	0	0	2,919	3,866
Labourers' Emergency, Ferry Road.	194	73	178	68	10	2	6	3	0	0	2,242	397
Chinese Isolation S.M.C.	259	352	244	307			15	45				
Totals	2,189	3,931	2,018	3,662	64	68	107	201	0	0	11,976	14,065

RABIES.

There were two deaths among Foreigners. One was in the case of an American child, aged 6 years, who had received the Pasteur treatment; the other, a Japanese who had not received the treatment.

There were three fatal cases among the Chinese.

ANTHRAX.

One case, which ended in recovery, occurred among Foreigners, in connexion with the performance of a post-mortem examination on an infected cow at a local dairy.

No deaths were recorded among the Chinese, but two patients were admitted to the Chinese Isolation Hospital at the beginning of the year, who had been working at a hide godown at Pootung.

PLAGUE.

No cases occurred among either human beings or rats during the year.

Two human cases and the discovery of a few infected rats were reported from Osaka during May, and the infection was believed to have been conveyed by shipping from Bombay. A small outbreak of Bubonic Plague was reported in Manchuria in the Tungliao district, near Newchwang, during July.

Details of Plague Prevention work will be found in Part VI—Sanitation.

In July a case, which ended fatally, was removed from the s/s "City of Tokio" to the Quarantine Station at Woosung; Laboratory examination confirmed the Port Health Officer's diagnosis.

ANNUAL INCIDENCE OF PLAGUE.

	1909	1910	1911	1912	1913	1914	1915	1916	1917	1918	1919	1920	1921	1922	1923	1924	1925	1926	1927	1928	1929
Plague Infected Rats	187	249	138	95	122	186	76	6	0	0	0	2	0	0	0	3	1	1	0	0	0
Human Plague	0	6	0	18	10	26	1	0	0	0	0	0	0	0	0	4	0	0	0	0	0

TYPHUS FEVER.

One fatal case was notified from the French Concession where the patient had been resident for some time, no source of infection could be discovered.

Among the Chinese three cases occurred, one being a police prisoner who had no fixed abode, the second, who died, having been employed in a vegetable godown, and the third was a Chinese Police Constable attached to Gordon Road Station.

RELAPSING FEVER.

Six cases were recorded among Chinese residents.

BERI-BERI.

There were 20 deaths amongst foreign residents; all of whom were Japanese. No previous notification was made of these cases.

ENCEPHALITIS LETHARGICA.

Two fatal cases occurred amongst Foreign residents.

MALARIA.

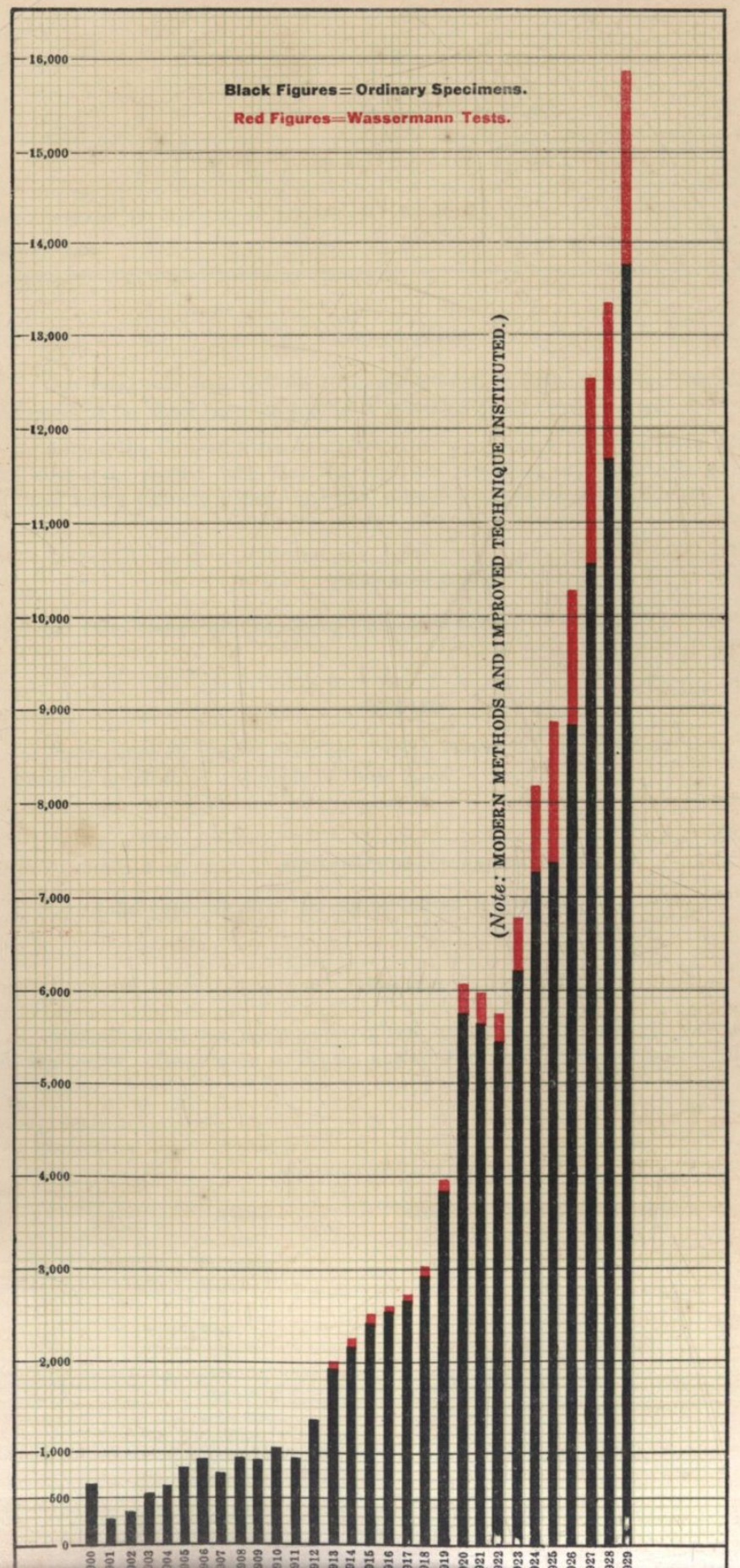
Altogether 111 new cases were notified during the year amongst civilians and the military forces. There were no deaths among Foreigners, and 8 were recorded among the Chinese.

SUMMARY OF CASES NOTIFIED.

Month.	*Civil.*	*Marine and Military.*
January	—	1
February	—	1
March	—	—
April	2	—
May	3	—
June	1	—
July	5	18
August	9	7
September	15	20
October	6	16
November	2	1
December	3	1
	46	65

ANNUAL NUMBER OF SPECIMENS EXAMINED

FOR THE LAST 29 YEARS



IV.—PUBLIC HEALTH LABORATORY.

PATHOLOGICAL.

The number of specimens received for routine examination at the Central Laboratory this year was 11,959 compared with 10,000 in the previous year. The branch laboratories at the General and Country Hospitals performed examinations on 1,890 and 2,295 specimens respectively.

The figures for the Central Laboratory show a notable increase over any previous year in the history of the laboratory. This is partly due to the steady increase in the demands made upon the Municipal Laboratory by local Medical Practitioners and also to the fact that epidemics of Cerebrospinal Fever and Cholera took place during the year.

The steady increase in the routine diagnostic work performed by the laboratory during the last 29 years is outlined in a chart, given on another page.

The Clinical Laboratory at the Country Hospital came under the general supervision and direction of the Chief Pathologist on February 15, 1929.

A Handbook of Information concerning the facilities offered by the Municipal Laboratories to Medical Practitioners and the Public has been prepared and is ready for issue.

This booklet contains amongst other matter of interest to medical practitioners, instructions as to the best methods of taking and transmitting specimens for examination, and a description of the various vaccines manufactured in the Pathological Laboratory.

In this year's report, only a few of the laboratory's activities are given in detail. Summaries will be found in the various charts appended.

On account of the serious prevalence of Cerebrospinal Fever in the first half of the year, notes are given on the bacteriological aspect of this disease. The bacteriological diagnosis of Cholera is outlined, as this has been frequently the subject of enquiry from neighbouring laboratories and from towns in other parts of the country.

The reconditioning of a certain number of the rooms used by the Pathological Laboratory and the re-allocation of space which took place during the early months of the year resulted in greatly increased facilities for performing the requisite technical work.

The Pathological Laboratory is concerned with the following:—

(I) Routine Diagnostic Examinations.
- Communicable diseases.
- General diagnostic examinations.
- Section preparation.
- Surgical pathology.

(II) Public Health Examinations.
- Bacteriology of water supplies.
- „ „ milk.
- „ „ ice-cream.
- „ „ preserved foods.
- Miscellaneous examinations.
- Examination of Rats as a part of routine Plague Prevention work.

(III) Pasteur Treatment (Anti-Rabic treatment).
- Preparation of anti-Rabies vaccine.
- Emergency treatment of wounds caused by suspected animals.
- Pasteur treatment of patients suspected of being infected with the virus of Rabies.
- Examination of animals for the Rabies virus.

(IV) Manufacture of Vaccines.
- Anti-smallpox vaccine (calf lymph)
- Anti-typhoid vaccine (enteric group).
- Anti-cholera vaccine.
- Anti-plague vaccine.
- Autogenous vaccines for individual patients.

(V) Experiment and Test Animals.

(VI) Preparation of Diagnostic Reagents.
- Nutrient media, etc.
- Agglutinating and haemolytic sera.
- Bacterial suspensions.

LABORATORY DIAGNOSIS, 1929.

Examinations	Central Laboratory & General Hospital		Examinations	Central Laboratory & General Hospital	
	Examinations	Positive Results		Examinations	Positive Results
Tests for Enterica	1,321		Gonorrhoea	387	90
Typhoid	920	377	Sections cut	211	—
Paratyphoid A	920	101	Autogenous vaccines	65	—
Paratyphoid B	920	139	Blood counts	556	—
Paratyphoid C	920	21	Other examinations	1,663	—
Cultures	401	8	Total of general pathological examinations	15,452	—
Diphtheria	2,666	509	Water supply	264	
Malaria	379	77	Miscellaneous sanitary examinations	108	—
Entamoeba Histolytica	863	101	Ice Cream Samples	65	
Active forms		86	Milk Samples	184	—
Cysts		15	Wassermann tests	2,073	644
Bacillary Dysentery	739	252	Rabies (Microscopic examination).	83	43
Miscellaneous Diarrhoeas	2,711	453	Rabies (Animal inoculation).	38	20
Cholera	1,090	892	Plague in rats	22,570	
Plague (human)	2	1			
Tuberculosis	1,440	317			
Meningococcus	868	443			
Spironema pallidum	491	69			
GRAND TOTAL				40,837	

COMMUNICABLE DISEASES.

Routine Diagnostic Tests (Enteric Group.)

THE RESULTS OF AGGLUTINATION TESTS ARE SHOWN IN THE FOLLOWING TABLE:—

	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.	Oct.	Nov.	Dec.	Total
Specimens	68	50	60	67	95	134	201	168	172	137	82	87	1321
Patients	58	42	48	57	78	117	181	138	156	106	66	72	1119
Positive results for Typhoid	20	16	17	16	30	34	43	48	52	38	34	29	377
Para A	1	4	3	3	5	7	6	23	16	19	3	11	101
Para B	2	4	10	6	6	13	14	23	16	23	12	10	139
Para C	1	3	2	2	4	4	1	1	2	—	—	1	21
Probable number of new cases of Typhoid	9	7	3	6	15	15	20	14	19	16	19	8	151
Para A	—	1	1	1	2	—	—	—	3	2	—	—	10
Para B	—	—	—	—	—	—	—	—	4	2	2	—	8
Para C	—	1	—	—	—	1	—	—	1	—	—	1	4

CASE DISTRIBUTION.

	Chinese.	*Other Asiatics.*	*Foreigners.*
Typhoid	114	1	36
Para A	8	—	2
Para B	6	1	1
Para C	3	—	1
1929—Totals	131	2	40
Last year's results	139	5	36

Diagnosis by blood culture was attempted in 30 cases, with 3 positive results. This is a most valuable procedure and more advantage might be taken of the facilities the laboratory offers in this connection.

Examination of cultures from faeces and urine again proved valuable, 371 cases being examined with 5 positive results.

Typhus.

The Weil-Felix test was requested in 35 cases of suspected Typhus fever. Agglutination with *B. proteus* strains was noted in 11 specimens.

The Weil-Felix test is now performed with 12 to 18 hours cultures of *B. proteus* X 19. Formalised suspensions have been discontinued since these may inhibit the reaction.

Summary of the Dysenteries and the Diarrhoeas.

Dysentery bacilli were isolated in 264 cases. *E. histolytica* free forms or cysts were found in 139 cases.

The relative proportion of bacillary to amoebic infection is represented by 7% for bacillary and 3% for amoebic dysentery of the total number of specimens examined for diarrhoea and dysentery.

The microscopical slide diagnosis of a dysenteric stool is valuable as an aid to practitioners in excluding *Entamoeba histolytica* as a cause of acute cases of dysentery, thus giving an early indication for the use of anti-dysenteric serum and probably shortening the course of the disease. The cultural examination is performed as a necessary confirmatory measure but takes about two days to complete.

The dysentery bacilli isolated were classified in the following groups:—

	Positive Results.
B. dysenteriae (Shiga strains)	57
B. dysenteriae (Flexner Y strain)	13
B. para dysenteriae	194

The latter group includes the many Flexner strains identifiable by homologous anti-sera and usually classified by type letters as U, V, X, Z, etc.

For all practical purposes this abbreviated classification is found sufficient and its use has permitted the pathologists to undertake a larger number of examinations during the summer and autumn prevalence of dysentery.

Examination of Stools for Helminthiasis.

1,340 stools were examined for ova and the following positive results were found:—

Ankylostoma	158
Ascaris	100
Oxyuris	1
Trichuris	123
Strongyloides	3

CHOLERA.

The number of cases examined during the year was 1,090 compared with 102 in 1928. In 609, vibrios were seen in sufficient numbers to confirm a clinical diagnosis under the prevailing circumstances. Of the 616 specimens examined culturally, Cholera vibrios were isolated in 283. Specimens were examined from 1,012 patients altogether, and the diagnosis was confirmed in 712.

The Examination of Stools for V. Cholera.

The methods used for the isolation of the cholera vibrio from the faeces are applied as a routine measure in their entirety at the commencement of an epidemic of cholera and up till such time as thirty fully proven positive cultures have been obtained.

When an epidemic has been established a modified procedure is adopted. This consists of examining all stools sent to the laboratory for (I) character of stool (II) microscopical examination. Should the character of the stool be choleraic and the film diagnosis positive, no further examination need be performed. If either the character of the stool or the film examination be doubtful or negative, the full test (using enrichment media) is carried out.

All special cases of cholera, such as those sent by the Port Health Authorities, are dealt with by the full test. It has been customary also, to submit all specimens from the Municipal Isolation Hospitals to the cultural test.

Cholera Specimens.—It is desirable that these arrive at the laboratory in batches at suitable times. Requests were therefore made to the various Isolation, Emergency and Summer Diseases Hospitals to have specimens sent in at 11 a.m. and 3 p.m.

Cholera Outfits.—The ordinary stool bottle firmly and carefully corked is by far the best container. The cholera swab outfit should not be used unless in a very considerable epidemic. The use of the stool bottle enables the pathologist to note the character of the stool, viz, rice water, diarrhoeal (watery), mucoid, faecal, and non-diarrhoeal.

On arrival of cholera specimens at the Laboratory, the card is stamped with the following:—

STOOL	
FILM	DATE
CULTURE	DATE

The specimen cards are registered by the Laboratory Clerk as follows:—

The card is first given a progressive serial number; it is then given two cholera numbers, (*a*) the serial number of specimens received during the year, (*b*) the serial number of each different nationality from which specimens are received (divided into "Chinese," "Asiatics other than Chinese" and "Foreigners," being marked thus "C_1", "A_1", "F_1", the numerals showing the number of specimens received from each). When more than one specimen is received from the same case it is marked—"C1A", "C1B", "C1C", etc.

The Pathologist examines each stool as to the naked eye appearance and notes same in the place provided.

Flakes from the specimen are then placed on microscopic slides and smeared out and dried. These films may be stained with 1 in 10 Carbol-Fuchsin or Loeffler's Methylene Blue. Microscopic examination is then made for suspicious vibrios.

In the height of an epidemic it is usual to find numerous characteristic vibrios. In some stools the vibrios appear granular, in others somewhat swollen and distorted. This bears out the fact that V. cholera is very subject to pleomorphism.

Long filamentous vibrios are regarded with suspicion, for certain cases of acute bacillary dysentery may simulate cholera closely. In these cases the presence of pus cells and exudate cells is usually evident in examination of the stained film.

Enrichment Media.—This consists of alkaline peptone water tubes of P*h*. 8.0.

Peptone water tubes are inoculated from each stool and these are subcultured for 8 hours incubation at 37° C.

In this medium, cholera vibrios proliferate with a tendency to the formation of surface film.

The subcultures on peptone water are examined as soon as possible after eight hours incubation. This is done before making the plate cultures since, if many contaminating organisms are found, a fresh peptone water culture may be sown.

The differential medium employed is Dieudonné of controlled ripeness. Plates are inoculated from the peptone water subcultures and are incubated for 18 hours at 37° C.

If satisfactory growth takes place on Dieudonné media, the colonies are examined for morphology. On alkaline media, true cholera vibrios occasionally show peculiar morphology.

The final diagnosis is made by agglutination tests. These may be carried out directly from the Dieudonné plates by the rapid macroscopic slide method.

For this purpose a small loopful of growth is rubbed up in a watch glass with saline and the homogenous suspension placed on a glass agglutinator strip. If several cultures are being examined at the same time, the identification numbers should be carefully noted.

The agglutinating sera used here are (1) V. cholera (S.M.C.) high titre serum diluted *1-25* (2) V. para cholera *Martin No. 1.* Dil: *1-25.*

Occasionally a Polyvalent Cholera Serum consisting of

V. cholera, S.M.C. (Hicks) strain	8,000
V. cholera, B. & W. B. 4957	1,600
V. para chol., Martin No. 1	4,500
V. cholera, Nasik	500

in dilutions of 1-100 may be tried but this serum is best used in the ordinary waterbath agglutination test when required.

For the full agglutination test at 56° C, it is advisable to subculture from the Dieudonné plate to lemco agar plates or veal broth tubes. This precludes any inhibition due to the alkalinity of the differential medium.

Subsidiary tests.—The Cholera Red Test.

The organism under investigation is grown on a special peptone medium for 48 hours and the test applied in the usual manner. The various strains isolated during the 1929 epidemic gave a positive "cholera red reaction."

Absorption test.—This is carried out on a selected number of cholera cultures annually and forms the final criterion as to the serological identity of local strains with true V. cholera.

When the reports are issued printed forms are used. Spaces are provided on these for:—the serial number, date specimen was received, date report issued, to whom sent, name of patient, and signature of pathologist. There are two different forms used (*a*) for reports on film examinations, (*b*) for reports on cultural examinations. The wording is as follows:—

(*a*) "Vibrios seen in film in numbers sufficient to confirm a clinical diagnosis of Cholera under present conditions."
"No vibrios seen in film."

(*b*) "Agglutinable vibrios, presumably true cholera, isolated."
"No vibrios isolated in culture."

When the report is issued the sentence not applying is struck out.

MALARIA.

Altogether 379 specimens were examined for Malaria with 77 positive results, 74 being of the Benign Tertian and 3 of the Sub-Tertian type.

ANTHRAX.

Material was examined from 14 human cases of suspected malignant pustule. Anthrax bacilli were found in 9 patients. 3 cows were examined for Anthrax with 2 positive results.

DIAGNOSIS OF VENEREAL DISEASES.

The Wassermann Test.

The same method has been employed as in past years.

The number of Wassermann tests performed during the year was 2,073, with 644 positive results.

Spironema Pallidum.

491 specimens were examined by the method of dark background illumination. Positive results were obtained in 69 cases. The percentage of positive results amongst cases other than those from the Venereal Diseases Clinic is 22.

Clinic specimens are submitted as a routine measure in all cases of chancroid. Usually three examinations are made to exclude the possibility of syphilitic chancre.

Gonococcus.

Altogether 387 cases were examined with 90 positive results.

DIPHTHERIA.

Altogether 2,666 specimens were examined from 1,569 patients with 509 positive results.

Virulence tests for B. diphtheria were performed on two occasions with one positive result.

THE EPIDEMIC OF CEREBROSPINAL FEVER FROM THE BACTERIOLOGICAL POINT OF VIEW.

The first positive spinal fluids in the current year were recorded in January 1929. These were sent from the Chinese Isolation Hospital. Thereafter the daily numbers examined increased to an average of 8 a day. The positive culture findings were:—

January	6	July	6
February	9	August	4
March	124	September	2
April	163	October	7
May	85	November	9
June	22	December	4

In order to obtain the most satisfactory results from the cultures made, a number of insulated hot water containers were prepared for transporting the fluids to the laboratory. These ensured that the spinal fluids were transmitted at body temperature, thus obviating negative cultural findings due to the extreme sensitiveness of the meningococcus to variations in temperature. These containers were placed at the disposal of the Isolation Hospitals and other sources of cases such as the Lester Chinese Hospital.

The morphology of the organism identified conformed to the standards which are accepted for the true *Diplococcus intracellularis* of Weichselbaum.

During the height of the epidemic it was very easy to obtain cultures, but towards the end of the epidemic positive cultures became less frequent and increasingly difficult to obtain. Direct examinations of the pus in the spinal fluids indicated that when the epidemic was at its height most examinations showed abundant meningococci.

Towards the decline of the epidemic, pus films showed few organisms and at times showed no organisms or apparently degenerate forms. This would appear to indicate

that the phagocytic power of the patients' leucocytes had increased, or alternatively that the infecting organism was for some reason becoming less resistant to the action of phagocytes.

In making these comparisons one is necessarily taking into consideration that Cerebrospinal Fluids are taken on the average about the same stage of the disease.

The laboratory facilities were chiefly used for diagnosis and only in a few selected cases were fluids submitted during the entire course of a patient's illness.

One such case was of particular interest, namely, a patient treated by the Assistant Commissioner, Hospital Division, with recovery.

The Hydrogen Ion Concentration of Spinal Fluid in Meningitis.

A series of observations was made in order to find out what deviation from normal occurred during the use of urotropin.

The method of performing the observations on the hydrogen ion concentration of the spinal fluids consisted in thoroughly centrifugalising the fluids to rid them of cellular content, then withdrawing the clear fluid without disturbing the layer of cells. The fluid was then brought to a constant temperature of 15° C. and tested by means of the Sorensen's standard tube method, much in the same way as the reaction of nutrient media is determined. Since the ranges chiefly fell between P*h*. 6.8 and 8.4 the usual indicator employed was Phenol sulphonephthalein (Phenol Red).

The results of the P*h*. determination when compared with other observations gave the general impression that the more acute the infection the lower is the P*h*. figure. By severity of infection from the point of view of the laboratory is meant abundant pus and numerous organisms in the spinal fluid.

No comprehensive clinical correlation was attempted. In one case spinal fluids were supplied during the entire course of the disease and the P*h*. figure of the fluid moved towards the alkaline side as convalescence set in. These observations throw a rather interesting light on the question as to whether abundant pus formation tends to alkalinity of the spinal fluid. Urotropine is usually administered with acid sodium phosphate in order that its effect may depend on the liberation of traces of formaldehyde in the spinal fluid, but it has been a rather disappointing drug in its practical application in epidemic meningitis. One may justifiably speculate as to whether the encouragement of acidity may have no inhibitory effect on the meningococcus. In one fatal case a positive blood culture was obtained as well as a positive spinal fluid culture.

SEROLOGICAL TESTS WITH THE MENINGOCOCCI ISOLATED DURING THE EPIDEMIC.

From time to time cultures were tested against type sera: that is homologus anti-sera prepared from strains associated with Gordon's Types I, II, III and IV. The majority of these tests gave entirely negative results. A polyvalent agglutinating serum was likewise tried but no agglutination response was obtained from all the earlier cultures in the epidemic.

In order that this investigation should be carried out as far as feasible in a routine laboratory, specific anti-sera were prepared. The meningococci isolated were termed, provisionally, "Shanghai strains."

Towards the end of the epidemic fresh batches of meningococcus anti-sera were obtained from various sources and a certain number of the "Shanghai strains" were found to be similar serologically to Gordon's Type III. Absorption tests were also carried out.

It is fairly reasonable to presume on reviewing the observations made in the Municipal Laboratory that the meningococcus responsible for the severe epidemic in the Shanghai area is a strain dissimilar from that responsible for epidemics in Europe and America.

During 1918 Hongkong suffered from a serious epidemic of meningitis and Dr. Olitsky, who was specially employed by the Government of the Colony to investigate the disease, found that the meningococcus associated with the outbreak was a strain distinct from those described by workers in Europe during the Great War.

Dr. Olitsky found it necessary to recommend the production of a specific antiserum. This dissimilarity of strain may account for the rather unfavourable results obtained with polyvalent anti-sera during the local epidemic this year, but the question of specificity of curative anti-sera and its manufacture is beyond the scope of the Municipal Laboratory and could only be undertaken by a properly equipped Serum Institute.

It is of value however to place on record such work as has been accomplished, so that when the time is ripe for the establishment of a Serum Institute, workers there will have the benefit of previous observations made in Shanghai.

Nasopharyngeal Examinations of Contacts.

These were performed on a small scale for one of the American marine units where a fatal case had occurred. As was to be expected, out of 44 contacts, 13 carriers were found. These persons remained in good health. Subsequent examinations indicated a rapid fall in the carrier rate.

On account of the Regulations enforced by the Government of the United States of America on persons entering that country, it was necessary for all such persons to have a medical certificate that they had been examined and found free from meningococci.

Nasopharyngeal swabbings were extensively carried out on behalf of the United States Navy. The facilities of the Municipal laboratory were placed at the disposal of the medical officers concerned, and altogether 381 examinations were performed.

Nasopharyngeal examination of contacts is only of value for isolated communities such as a ship's company or a military camp and is of very doubtful value if applied wholesale to civilian contacts.

The bacteriological investigation which has to be applied in each suspected positive case takes considerable time, and the work is not commensurate with the results obtained. Any hygienic measure such as wholesale antiseptic spraying should not depend on the bacteriological results obtained from a few contacts. In any case such a measure would require to be applied before the possibility of obtaining accurate bacteriological findings from nasopharyngeal examinations.

It is interesting to note that during the routine examination of the total of 868 spinal fluids for meningococcal meningitis, 4 cases of tuberculous meningitis were detected. No cases of mixed infection were noted. This is rather unusual since experience of epidemics of meningitis elsewhere has led to the belief that a certain number of patients with chronic middle ear infection have had the lesion exacerbated if suffering from meningitis. Other organisms such as staphylococci, diphtheroids and occasionally B. pyocyaneus have been found in the spinal fluid.

PLAGUE.

One human case of plague was confirmed by laboratory examination. This specimen was received from the Port Health Officer. No local cases were found. 22,570 examinations of rats gave no positive results.

A survey made during 1923–1926 showed that rats and rat fleas were present in the following proportions.

Rats.	
Rattus rattus (the black rat)	72.8%
Rattus norvegicus (the brown rat)	27.2%
Rat Fleas.	
Xenopsylla cheopis	11.4%
Ceratophyllus fasciatus	36.3%
Ctenopsylla musculi	51.1%
Ctenocephalus felis	1.2%

TUBERCULOSIS.

Altogether 1,440 specimens were examined, with 317 positive results.

General Diagnostic Examinations.

Altogether 1,569 examinations of specimens for general medical purposes were made. This figure includes haematology for the anaemias, urinary examinations in nephritis, etc. Eight precipitin tests were performed on blood-stained articles for medico-legal purposes.

SECTION PREPARATION AND SURGICAL PATHOLOGY.

The facilities the laboratory offers in this connexion have been utilised to a much greater extent during recent years; 211 tissues were examined by histological methods, compared with 165 last year.

PUBLIC HEALTH EXAMINATIONS.

Water Supplies.

Routine bacteriological examinations were performed on the supplies of the Shanghai Waterworks Company.

The standard of purity is taken as 10 B. coli per litre as a maximum. This standard has been well maintained in all samples taken from the mains. Any cases of pollution have been found to be due to local contamination subsequent to damaged pipes in a water-logged subsoil. On account of the possibility of damage to pipe lines passing through contaminated subsoil by the increasing heavy road traffic of the city, it is a necessary safeguard to boil drinking water or to filter it efficiently for household use. Service pipes and cisterns in new buildings, are especially liable to temporary pollution. This is almost inevitable and in such cases the whole system should be thoroughly flushed out before using water for domestic purposes.

Summary of Results.

Month.	*Number of samples below standard. (10 B. Coli group per litre).*
January	—
February	—
March	—
April	1
May	6
June	—
July	12
August	8
September	3
October	4
November	2
December	2
	38

This gives a total of 38 found below standard out of 264, which shows a high degree of purity, considering local conditions.

Well Waters.

The forêgoing remarks apply also to the results of bacteriological examination of deep well waters. The system of storage and conveyance is of prime importance. The water may issue from the well at a high degree of purity only to be polluted in tanks or service pipes. It is necessary that the results of the bacteriological examination of water supplies should invariably be considered in conjunction with chemical analysis, and this is specially important where occasional sterilisation by chlorination is performed. Obviously the free chlorine content should be considered along with the estimated numbers of bacteria in relation to any particular sample.

Water Supplies from Outports.

Where a bacteriological analysis is desired it is necessary to have the samples sent to the Laboratory in sterile water sampling bottles kept on ice. Without this precaution the results of bacteriological examination would entail an unknown relation to the original bacterial content of the water. The greatest care should be exercised in taking the sample and noting the location, time and general conditions prevailing. A sample should be taken for chemical analysis at the same time. When these conditions are fulfilled a much more valuable record can be obtained.

Aerated Waters.

Of the 21 samples examined, 20 were found to be up to the required standard. The bacteriological standard of purity is taken as 10 lactose fermenting B. coli Communis per litre as a maximum.

Ice Cream.

The standards required have been unchanged. Most ice creams manufactured locally have been satisfactory, thus indicating that there is no reason why a pure ice cream can not be manufactured in Shanghai, provided adequate precautions are taken.

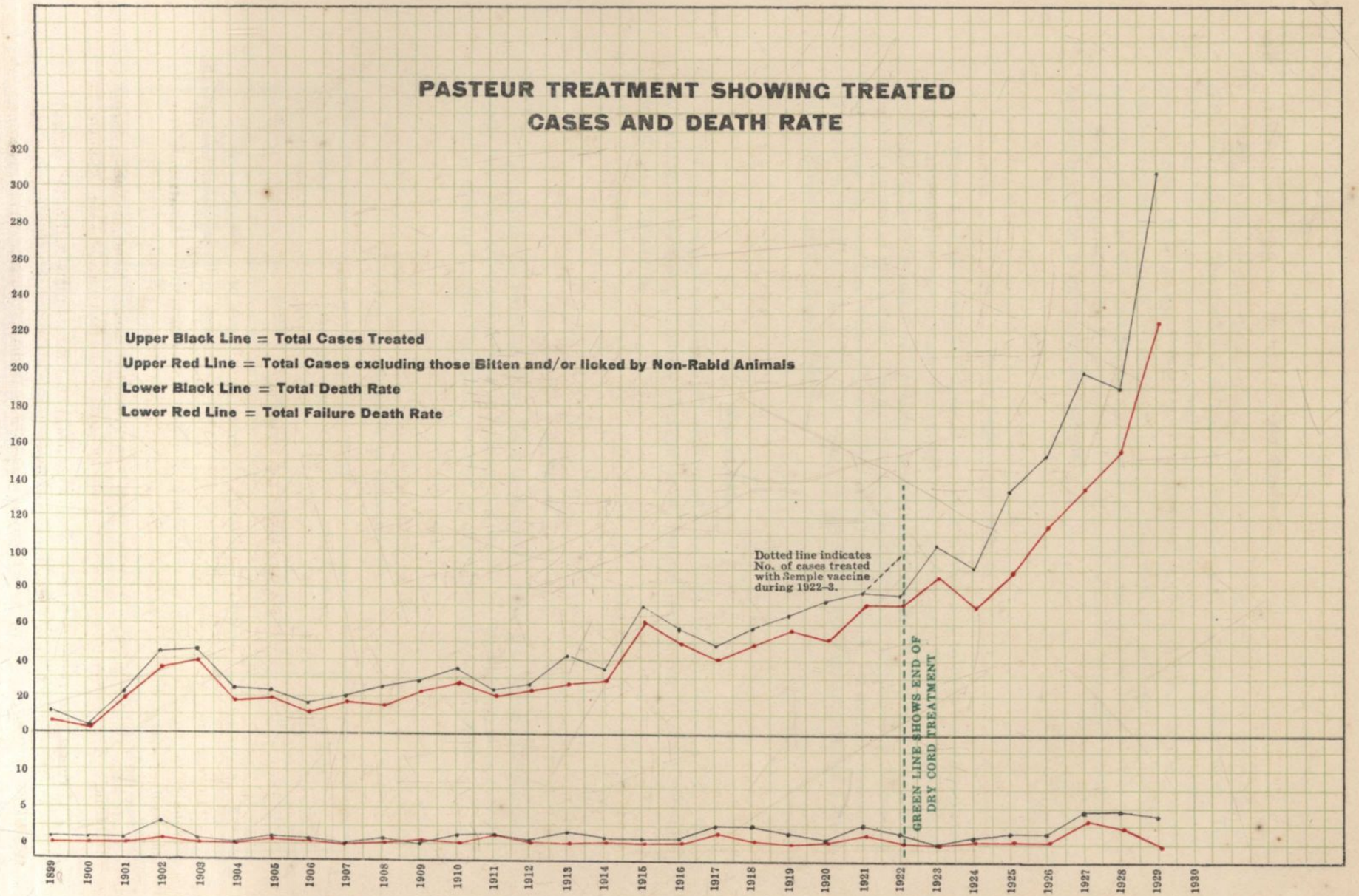
SUMMARY OF EXAMINATIONS.

Dates	Foreign Shops.		Chinese Shops.		Total.	
	Satis.	Unsatis.	Satis.	Unsatis.	Satis.	Unsatis.
April 8—May 31	10 (83%)	2 (17%)	1 (10ᵬ%)	—(—%)	11	2
June 7—July 26	15 (75%)	5 (25%)	3 (60%)	2(40%)	18	7
Aug. 2—Sep. 27	18 (72%)	7 (28%)	1 (50%)	1(50%)	19	8
					48	17

MILK.

The grading of the milk supply from the bacteriological standpoint was performed and the tables given below show the results obtained from the series of milks tested.

PASTEUR TREATMENT SHOWING TREATED CASES AND DEATH RATE



The grading was based on the standards used in British and American practice, with due allowance for local conditions.

BACTERIOLOGICAL STANDARD FOR MILK EXAMINATION.

Grading.	*Plate Count.*	*Coliforms.*
Pasteurised	30,000	B. coli Absent 0.1 cc.
Grade A (Raw Milk)	200,000	B. coli Absent 0.01 cc.
Unsatisfactory for Grade B Produce	Over 1,000,000	B. coli Present 0.001 cc.

Month	Number of Specimens	Grading				
		Raw Milk			Pasteurised	
		Grade A	Grade B	Unsatisfactory	Satisfactory	Unsatisfactory
January	12	9	—	—	3	—
February	12	7	—	—	5	—
March	16	8	—	1	7	—
April	16	10	1	—	4	1
May	20	12	1	1	6	—
June	16	3	2	6	3	2
July	14	2	2	3	2	5
August	18	3	—	4	5	6
September	20	6	—	—	11	3
October	16	3	2	2	9	—
November	16	6	1	1	8	—
December	8	3	—	—	4	1
Total	184	72	9	18	67	18

Miscellaneous examinations were performed on the following preserved food stuffs:—

Tinned soups and meats.

Frozen egg products.

Frozen whole egg.

Flaked whole egg.

PASTEUR TREATMENT.

Anti-Rabic Treatment.

During the year the Semple modification of the Pasteur Treatment was used. 705 persons came from the outports and Shanghai area for advice regarding treatment. Of this number 325 received a course of treatment with Anti-Rabic vaccine.

Four fatal cases were reported from the Shanghai area. None of these were "failures." There were no fatalities reported amongst the cases treated in the Outports.

A report was received from Pagoda Anchorage that a rabid dog had bitten several patients. Three were treated with Municipal laboratory anti-rabic vaccine in Shanghai and two locally. One patient refused treatment and died on the 47th day. There were no fatalities among the treated cases.

DOGS AND OTHER ANIMALS UNDER OBSERVATION.

Month	No. of Animals Admitted		Bitten	Died	Rabid	Returned to Owners	Retd. to Police
	Dogs	Cats					
January	11	5	12	3	1	9	4
February	11	2	12	4	1	9	—
March	16	—	16	—	—	14	2
April	14	1	15	—	—	13	2
May	32	—	27	3	3	26	3
June	33	—	26	2	2	25	6
July	43	2	30	2	2	33	10
August	32	2	30	1	1	30	3
September	22	3	20	3	2	18	4
October	17*	3	17	1	1	17	2
November	12	1	12	1	1	10	2*
December	4	1	4	2	2	2	1
Total	247	20	221	22	16	206	39
1928	212	9	190	13	11	163	36
1927	176	—	162	19	16	124	18
1926	141	—	120	14	10	99	28
1925	136	—	109	7	4	104	25
1924	141	—	116	17	15	108	16

*One Monkey.

Observation Kennels.—Animals admitted to the kennels under observation for rabies numbered 246 dogs, 20 cats and one monkey compared with 212 dogs and 9 cats for the preceding year. There was a great increase in the number of animals admitted during May, June, July and August. The exceptionally large number during July necessitating the provision of additional kennels. Of the total number of animals admitted, 221 had bitten people, an increase of 31 over the returns for 1928. Twenty-two dogs died in the kennels, of which 16 were rabid; 5 more than last year.

MANUFACTURE OF VACCINES.

Smallpox Vaccine.

The preparation of smallpox vaccine has been elaborated during the past five years, and very stringent tests as to its potency and freedom from pathogenic organisms are applied before any batch is passed for issue. The tests are in conformity with the Therapeutic Substances Regulations 1927 (Great Britain) with such additional tests and detailed procedures as have been adopted in the Shanghai Municipal Laboratory.

Reports are received from the free vaccination centres of the Public Health Department as to the "takes" in primary cases when a new lymph batch is issued from stock. This additional control is of considerable value.

Altogether 335,148 doses of Smallpox Vaccine were issued.

Certain free issues were made to vaccinating centres in adjacent Chinese areas and charges were reduced to Mission Hospitals, and charities in the Shanghai district and Outports. The S.M.C. Smallpox Vaccine was used by units of the Naval and Military forces of several nations stationed in Shanghai and other ports in North China.

Typhoid-Paratyphoid Vaccine.

5,356 sets of this vaccine were issued. It consists of B. typhosus, B. paratyphosus A, and B. paratyphosus B. So far it has not been found advisable to incorporate B. paratyphosus C.

The vaccine is supplied either in large ampoules sufficient for the complete prophylactic inoculation of 14 persons or in small sets for individual use. The three dose system of prophylactic inoculation is becoming more popular and the sets are so prepared that they can be used in this way. Each set contains 1,000 million B. typhosus, and 750 million each A. and B. per c.c.

Cholera Vaccine.

8,754 doses were issued. This was in great demand during the Summer months. Dosage recommended is an initial dose of ½ c.c. followed in 7 to 10 days by 1 c.c.; 1 c.c. contains 4,000 million organisms.

Plague Vaccine.

218 doses were issued. This vaccine was requisitioned for hospitals in the Foochow and Shensi districts. No local issues were required. The first dose consists of approximately 1,500 million B. pestis, in ½ c.c. capsules. The second dose contains approximately 3,000 million organisms per c.c. It is injected seven days later.

Semple Vaccine.

This vaccine was used in the Pasteur Institute. 86 sets of 18 doses were issued to Outports: (*Vide* Pasteur treatment).

Free Issues.

Free issues of 19,380 doses of Smallpox Vaccine were made to the Chinese Hospitals in the Settlement, 11,415 doses of Smallpox Vaccine to institutions in French Concession, and 9,770 doses of Smallpox Vaccine, 96 sets of Typhoid-Paratyphoid Vaccine and 500 doses of Cholera Vaccine to philanthropic vaccinating centres in surrounding Chinese territory.

Operative Procedures.

The experimental animals used in connection with Smallpox Vaccine manufacture were as follows:—

Lymph production	Calves	93
Intensification of virus	Rabbits	28
Potency tests	Rabbits	44
Aerobic Sterility tests	Rabbits	70
Anaerobic sterility tests	Guinea pigs	78

In connection with the Pasteur treatment and manufacture of Anti-Rabic Vaccine

Fixed virus	Rabbits	298
Virulence tests	Rabbits	8
Diagnosis of rabid animals	Rabbits	42
Sterility tests	Rabbits	6
	Guinea-pigs	4
Experiments	Rabbits	21

In connection with the diagnosis of

Tuberculosis	Guinea-pigs	8
Diphtheria (Virulence)	Guinea-pigs	13
B. Pestis	Guinea-pigs	3
	Mice	6
Pneumococcus	Mice	1

In connection with preparation of Wassermann reagents

Rabbits	4
Sheep	4
Guinea-pigs	228

Preparation of Diagnostic Reagents.

Media.

The following amount of media for routine purposes was manufactured during the year:—

Medium	*Volume.*	*Medium.*	*Volume.*
Bile Salt Agar	89 litres	Alkaline Peptone Water	19.4 litres
Lemco Agar	50 „	Trypsin Broth	52 „
Trypsin Pea-Extract Agar	21.5 „	Blood Digest Broth	20 „
Loffler's Blood Serum	10.2 „	Peptone Water	9.5 „
Bile Salt Broth (Single)	76 „	Chopped Meat	4.5 „
Bile Salt Broth (Double)	30 „	Miscellaneous Media	16 „
Veal Broth	29 „		
		Total	427.1 litres

A large quantity of Cholera media was made to meet this year's demand.

Media of various sorts were issued to local institutes and Naval and Military units. Total amount 8.75 litres.

The following items were issued to other laboratories and institutes during the year.

Standard Stock Cultures	20
Standard Agglutinating Supensions	600 ccs.
Agglutinating Sera (dil 1/100)	900 ccs.

The following reagents were prepared during the year.

Kahn's Antigen 100 ccs.
Agglutinating Suspensions 8 litres.
Haemolytic Sera 15 ccs.

LABORATORY ANIMALS.

The stock of animals at the breeding sheds was well maintained. 465 rabbits and 314 guinea pigs were supplied to the Pathological Laboratory; in addition, 170 rabbits and 73 guinea pigs were supplied to local and other hospitals and institutions. The stock at the end of the year numbered 401 rabbits and 526 guinea pigs. Ninety-three vaccine calves were used.

LABORATORY (CHEMICAL).

The total number of analyses and preparations carried out during the year was 3,545 as against 3,318 in 1928.

MILK.

Altogether 2,073 samples were tested for purity and 30 of these were certified as adulterated; a further 49 samples were returned as being of poor quality or of doubtful purity.

The results are summarised and compared with the figures for previous years in the following tables.

Extent of Adulteration.

4	Specimens contained	1%	to 10%	of added	water.
12	„ „	10%	to 20%	„ „	„
7	„ „	20%	to 30%	„ „	„
1	„ „	over 30%		„ „	„

6 Specimens were deficient in fat.

CLASSIFICATION OF SAMPLES.

	Number of Samples.	Number adulterated.	Percentage adulterated.
A. Formal samples from licensed dairies	2,039	16	0.78
B. Formal samples from unlicensed dairies	24	13	54.17
C. Samples sent in by the public	10	1	10.00
TOTAL SAMPLES	2,073	30	1.44

Comparison with previous years. Figures up to 1911 are omitted.

	1911	1912	1913	1914	1915	1916	1917	1918	1919
Number of samples examined	449	456	511	505	430	433	329	335	474
Percentage found adulterated	12	14.7	8.8	8.7	3.7	4.6	1.8	1.2	3.6

	1920	1921	1922	1923	1924	1925	1926	1927	1928	1929
Number of samples examined	691	630	694	1,130	1,236	1,622	1,714	1,876	1,880	2,073
Percentage found adulterated	8.8	9.8	6.8	7.3	2.5	2.59	1.86	1.54	1.91	1.44

The percentage of adulterated samples in those from licensed dairies continues satisfactorily low. Of the samples from unlicensed dairies over fifty per cent. were adulterated. The freezing point test has been regularly applied to differentiate between the deliberate small adulteration with water and milk of naturally poor quality, and the samples returned as being of poor quality have been either those with a fat content approaching too nearly the minimum limit of 3 per cent. or those with a naturally somewhat low solid-not-fat content.

WATER.

CHEMICAL ANALYSIS OF SHANGHAI WATERWORKS WATER.

Month	Total Solids	Hardness	Chlorine in Chlorides	Nitrates	Saline Ammonia	Albuminoid Ammonia	Oxygen absorbed in 1 hour at 37° C.	Bacteriological Report (Number of Samples below Standard)
			Parts	*Per*	*100,000*			
January	13.0	8.0	2.3	0.0764	0.0244	0.0096	0.0597	0
February	49.0	12.5	19.2	0.0453	0.0114	0.0062	0.0350	0
March	34.0	11.5	12.0	0.0563	0.0046	0.0056	0.0348	0
April	16.0	10.0	3.9	0.0989	0.0050	0.0082	0.0580	1
May	21.0	13.0	4.4	0.0689	0.0040	0.0055	0.0304	6
June	25.0	13.5	4.8	0.1593	0.0046	0.0070	0.0541	0
July	18.0	10.0	3.6	0.0983	0.0026	0.0100	0.0880	12
August	17.0	12.0	2.3	0.1222	0.0006	0.0062	0.0612	8
September	19.0	13.0	3.7	0.1127	0.0012	0.0080	0.0924	3
October	18.0	12.0	2.9	0.1125	0.0014	0.0078	0.0613	4
November	15.5	9.0	3.0	0.0977	0.0064	0.0110	0.0874	2
December	28.0	11.0	9.1	0.1095	0.0390	0.0150	0.0687	2

The result of the monthly analyses are tabulated above.

Daily observations have been continued on the clarity of the water, temperature, chloride, free chlorine and saline ammonia contents and the presence or absence of nitrites. These observations are made on samples taken from the laboratory taps. Free chlorine determinations are also made on samples taken at the same times and places as the samples taken for bacteriological tests.

The clarity of the water has been consistently good throughout the year. Variations in the chemical figures have been unimportant except for those caused by infiltration of salt water at intervals during January, February, March, April, May and December. Maximum figures for chlorine in chlorides in parts per 100,000 observed during these months were January—15.5, February—20.8, March—12.2, April—19.0, May—21.4, December—9.5. These periods of slight salinity were of very short duration.

Free chlorine has varied between a minimum of 0.02 and a maximum of 0.3 parts per million in samples from the laboratory tap. The saline ammonia figure was higher than normal in January, February and parts of March and December but normal during the remainder of the year. The minimum temperature noted was 6.0° C. (42.8° F.) in February and the maximum 31° C. (87.8° F.) in July and August.

Deep Well Waters.

Amongst deep well waters examined during the year were 24 samples from new deep borings in and around Shanghai. The characters of these waters accorded with observations already made and noted in the paper entitled "Deep Well Waters in the Shanghai Area" and commented on in brief in previous reports. Some 16 samples from deep borings in other places in China were also examined.

Open Air Swimming Pool.

The routine control by laboratory tests of the copper purification treatment of the water instituted in 1928 was continued during the 1929 season. With this and with the

filtration and sterilising plant operating satisfactorily the water was kept in excellent physical condition and in a high degree of purity.

Gas Analyses.

The Shanghai Gas Company's gas has been found well within the limit in respect of content of Carbon Monoxide on each occasion of testing.

Toxicological and Allied Investigations.

Twelve viscera were examined for poisons, positive results being obtained in six of these. Opium was found in three; potassium cyanide was present in the stomach contents in two cases in amounts of 6 and 23 grains respectively, and veronal was extracted from the stomach contents and urine of another case in total amount of 26 grains. The method of administration in the cases of cyanide poisoning was proved by the analysis of materials found near the victims.

A specimen of blood from a case of suspected carbon monoxide poisoning was examined with definite positive results.

Out of ten specimens of stomach contents, urine, etc., submitted in connection with hospital cases of suspected poisoning, three showed the presence of either opium or morphine, 6 gave negative results and in one case indications of an alkaloid, not identified, were obtained. A further eighteen specimens of medicines, drugs, etc., were examined in connection with suspected poisoning cases. In two cases potassium cyanide was found and in one morphine was present in small amount. The other specimens contained no ingredient of poisonous character.

Fourteen specimens were examined for blood stains, ten giving positive results.

Specimens submitted in connection with a case of violent death and mutilation consisted of chloroform and sulphuric acid.

Narcotics (Opium, Morphine, etc).

The total number of materials examined was 31. Of 10 lots of a thick dark brown paste previously referred to under the name "Li Ah Tz" and now submitted under the name "Pi Yeu," six showed the presence of opium in small amount. Three lots of pills contained morphine or heroin together with caffeine, strychnine and a cinchona alkaloid. Of other materials five contained opium or morphine, three consisted of heroin, one of strychnine nitrate and one of cocaine. Eight other specimens contained no narcotic drugs.

Foods and Liquors.

Food samples examined have included butter and margarine, flour, bacon, cream, tinned meats and vegetables, tinned milk, infants' foods, etc. Of 10 samples of margarine, 7 contained boric acid preservative in amount between 0.28 and 0.45 per cent. Four samples sold as butter consisted of margarine.

The examination of coloured Chinese sweetmeats and cakes was again undertaken near the time of the Chinese New Year, and a total of 135 samples were tested. Two samples were found to be coloured with Red Lead, a poisonous lead pigment; amounts of 4 and 5 grains respectively being contained in one sweetmeat. No arsenical pigment was found, the remaining 133 specimens being coloured with aniline or vegetable colours. Liquors examined have included wines, beer, vodka and native spirit.

Miscellaneous.

Specimens examined for medical diagnostic purposes include urine (139), blood (for sugar, urea, uric acid, etc., 43), faeces (for occult blood fats, etc., 20), gastric contents (14), fractional test meals (6), human milks (14), cerebrospinal-fluids (13) and sugar tolerance tests (4).

Drugs and medicinal preparations have included medicated waxes, opium and preparations, liquid extracts, bleaching powder, eusol, cod liver oil emulsion, etc. The preparation of sodium—potassium—bismuth tartrate has been continued.

General analyses and tests have included kerosene, egg products, coal, cotton seed meal, materials for fire damage, malt, menthol, soda ash, etc. Antifly and mosquito mixtures were prepared for the Sanitation Division as were also various experimental mixtures.

Other activities included, in addition to various special reports, the attendance of the Analyst or Assistant Analyst at the meetings of a Sub-committee of the General Chamber of Commerce which was formed to consider the existing Harbour Regulations dealing with hazardous goods.

V.—MUNICIPAL HOSPITALS.

The Hospitals Division is concerned with the Medical and Nursing Services administered by the Public Health Department.

It is grouped under the following headings:—

PUBLIC HEALTH MEDICAL SERVICES:—
- *Isolation Hospitals*
  - Foreign
  - Chinese
- *Mental Hospital*
  - Foreign
- *Municipal Sanatorium for Tuberculosis, Hungjao Road*
  - Foreign
- *Mokanshan Sanatorium*
  - Foreign
- *Clinics*
  - Tuberculosis
  - Venereal Diseases
- *District Nursing*
  - Child Welfare Work

POLICE AND GAOL MEDICAL SERVICE:—
- *Chinese Police Hospital*
- *Indian Police Hospital*
- *Ward Road Gaol Infirmary*
- *Reformatory*
- *Amoy Road Gaol Infirmary*
- *Remanded Prisoners—Medical Inspection*
- *First Aid Lectures to Police Force.*

MEDICO-LEGAL:—
- *Autopsies at Public Mortuary*
- *Medical Reports for Provisional Court on Inspection of Bodies*

MISCELLANEOUS:—
- *Medical examination of candidates for Municipal employment*
- *Medical Boards on Municipal employees, in consultation with private doctors*
- *Medical service to Chinese staff of Fire Brigade*

MUNICIPAL AMBULANCE SERVICE

General Remarks.

Cholera and Cerebrospinal Fever appeared in epidemic form during the year. Smallpox was fairly prevalent during the early part of the year, and a considerable proportion of the cases admitted to hospital were of a severe type. A number of cases of Cerebrospinal Fever were admitted to the Foreign and Chinese Isolation Hospitals early in the year, and increased rapidly in March and April. After that there was a diminution in the number of cases, but a few were admitted till the end of the year.

Cholera broke out in epidemic form in August and the number of cases admitted for treatment exceeded that of 1926. In consequence of these two epidemics following one another without an appreciable break, accommodation in both Isolation Hospitals was severely taxed and a great strain was put upon the Nursing Staff.

A moderate number of cases of Dysentery, both amoebic and bacillary, occurring among the Chinese Police, were treated, as in former years, in a special ward of the Chinese Isolation Hospital.

The Municipal Sanatorium for Tuberculosis at the corner of Hungjao and Macleod Roads was opened in August. The accommodation was quickly taken up, especially the male beds in the free wards. Most of the patients admitted were in a comparatively advanced stage of the disease, and therefore in need of prolonged treatment, but already many patients have derived considerable benefit.

The Tuberculosis Clinic was carried on without any special change in routine, and there was still difficulty in providing hospital treatment for many of the destitute patients.

There was a marked increase in the number of patients attending the Venereal Diseases Clinic.

The limited accommodation in the Mental Hospital has been severely taxed, and on several occasions it was impossible to admit new cases of either sex.

The Mokanshan Sanatorium was opened for the customary six months of the year and continued to be as popular as ever with Municipal employees.

The Chinese Police Hospital was carried on in the old Victoria Nursing Home, but the arrangement is only a temporary one and plans are already prepared for new completely equipped, modern Gaol and Police Hospitals in the Ward Road. It is hoped that these will be ready for occupation next year.

The whole of the Chinese and Indian Police Force, and the Chinese members of the Municipal Fire Brigade were vaccinated against smallpox and inoculated against typhoid and paratyphoid fevers during the first half of the year.

The staff of Chinese Medical Officers was increased from eleven to twelve in order to deal with the ever-increasing demands for medical services, especially at the Ward Road Gaol.

The Municipal Maternity Home which had, for eleven years, admirably fulfilled the needs of the community, was formally closed in June, its function being undertaken by the Country Hospital.

MUNICIPAL HOSPITALS.
ACCOMMODATION AVAILABLE.

ESTABLISHMENT.	1st Class	2nd Class	Free	Total
Mental Hospital	16			16
Police Hospitals:—				
Indian				28
Chinese				70
				— 98
Isolation Hospital:—				
Tuberculosis Block	2		21	23
East Block	2		17	19
West Block	15		69	84
Observation	1		3	4
				—130
Isolation Hospital for Chinese ..	8	8	134	150
Municipal Sanatorium for Tuberculosis	2	2	32	36
			Total Number of Beds	430

Admissions into Isolation Hospitals.

Disease.	Foreigners.		Chinese.	
	Admitted.	Died.	Admitted.	Died.
Smallpox	70	16	185	60
Cholera	56	6	434	60
Diphtheria	61	3	103	15
Scarlet Fever	101	5	130	29
Tuberculosis	121	31	16	1
Plague	0	0	0	0
Measles	1	0	0	0
Relapsing Fever	0	0	1	0
Beri-beri	0	0	0	0
Leprosy	0	0	0	0
Syphilis	0	0	0	0
Typhus	0	0	0	0
Rabies	1	1	2	2
Cerebrospinal fever	69	33	518	278
Influenza	0	0	0	0
Mumps	0	0	0	0
Anthrax	0	0	13	1
Dysentery	16	3	116	0
Other diseases	46	1	300	22
Contacts	5	0	148	0
Diarrhoea	3	0	61	0
Total	550	97	2027	468

FOREIGN ISOLATION HOSPITAL.

There was a considerable increase in the number of cases admitted, 550 compared with 376 in 1927, and 395 in 1928.

The largest number were on account of Pulmonary Tuberculosis, Scarlet Fever, Smallpox, Cerebrospinal Fever, Diphtheria and Cholera in order of frequency.

The majority of cases of Pulmonary Tuberculosis were in the advanced stage in which hope of arrest of the disease was small, and treatment only availed to relieve distressing symptoms.

Scarlet Fever.—The majority of cases were admitted during March and April, and most of them were of a comparatively mild type, the case mortality being approximately 5%. Scarlet Fever antitoxin was administered in most cases, in doses varying from 10 c.c. to 60 c.c.

Cerebrospinal Fever.—Altogether sixty-nine cases of the following nationalities were admitted, the disease being generally of a severe type, with a mortality of 48%.

The nationalities of the patients were as follows:—

Japanese	23	French	1
British	12	Greek	1
British (Indian)	9	Italian	1
Russian	8	Persian	1
American	7	Polish	1
American (Filipino)	3	Unknown nationality	1
Dutch	1		

In the milder cases some stiffness of the neck and Kernig's sign were present: headache was invariable. In more advanced cases rigidity and retraction of the head were present, and many were unconscious on admission.

Specific treatment was carried out with antimeningococcal serum.

Cholera.—The majority of the patients were Japanese and the disease was of a severe type.

CHINESE ISOLATION HOSPITAL.

Full use was made of the accommodation and facilities of this hospital during the epidemic of Cerebrospinal Fever and Cholera, and the resources of the staff were strained to the uttermost.

So great was the demand for accommodation that at one time it was necessary to give preference to Chinese who were resident within the Settlement.

Altogether 518 cases of Cerebrospinal Fever were admitted, the maximum number 176, being in May.

Twice as many males as females were admitted and the majority affected were young adults.

Age Periods.	
Under 5 years	4%
5—14 „	33%
15—25 „	41%
26—45 „	20%
Over 45 „	2%

The majority of cases were of a severe type and many were unconscious on admission. A petechial rash was observed in about 5% of cases.

The usual difficulty was experienced in persuading relatives to leave patients in hospital until recovery was completely established.

The routine treatment was lumber puncture followed by the administration of specific serum.

The mortality for all cases admitted was 60%.

Cholera.—The majority of patients were admitted during August and September and were of the poorest classes from the surrounding Chinese districts.

The routine treatment of intravenous injection of hypertonic saline was followed. The mortality for the 434 cases admitted was 13.8%.

Anthrax.—There were 13 cases admitted, one of which proved fatal. Treatment with intravenous injections of arsenical compounds was found to be satisfactory.

Rabies.—Two fatal cases were admitted, in neither of which had Pasteur treatment been given.

MENTAL HOSPITAL.

The whole of the accommodation was in continuous use, and admission had to be refused to many cases during the year.

The Mental Hospital was originally established in 1907 in connexion with the Victoria Nursing Home, and was only intended for the temporary care and treatment of acute cases pending repatriation.

The great increase in the number of foreigners in the Settlement during recent years, especially of Russians, has made the problem of the care of chronic mental cases an acute one, and in 1927 a proposal was made to build a new Mental Hospital of 36 beds.

Circumstances prevented the carrying out of this proposal at the time, and the matter has become one of increasing urgency and importance. An unsuccessful attempt was made to obtain repatriation of those patients possessing Soviet passports. Twelve patients were repatriated to their own countries.

To the men's wards 44 were admitted, and there were 8 deaths; to the women's wards 11 were admitted and there was 1 death.

MOKANSHAN SANATORIUM.

The Sanatorium, which had been closed since 1926 on account of political unrest, was re-opened from June to October.

Conditions throughout the Season were peaceful, although one lady and her party were robbed, between railhead and San-Chiao-Poo, while making the journey to Mokanshan by houseboat.

The recently established private motor car service using the new motor road from Hangchow to the foot of the hill, enabled the journey from Shanghai to Mokanshan to be made in less than 9 hours.

VISITORS.

Year.	*No. of Visitors.*
1907	9
1908	71
1909	62
1910	76
1911	81
1912	108
1913	87
1914	126
1915	136
1916	106
1917	112
1918	150
1919	175
1920	167
1921	187
1922	169
1923	202
1924	132
1925	123
1926	195
1927	—
1928	—
1929	109

Distribution of Visitors—1929.

Police Department	75
Public Health Department	15
Shanghai Power Co.	8
Public Works Department	5
Shanghai Fire Brigade	3
Revenue Department	1
Secretariat	1
Educational Department	1
	109

Summary.

Adults	88
Children	21
	109

A schedule of increased fees came into force during the current year.

Owing to the shortage of staff, it was necessary to allot these duties to one nurse and although the work increases annually, the present arrangement has, so far, worked satisfactorily.

In co-operation with the King's Daughter's Society and its Medical Officers, and with the assistance of the Medical Superintendent of the General Hospital, a great deal of useful work was carried out in connection with the sick poor. The Convalescent Home, Hungjao Road, was full during the greater part of the year, and in July, August and September 41 convalescent women and children were accommodated in the Whashing Road Home by arrangement with the Committee of the Foreign Women's Home.

The Infant Welfare clinic was not so well attended as was anticipated. Dr. Klatchko kindly provided dental treatment at reduced fees.

Visits paid and received at K.D.S. office	1,738
Vaccinations done	112
Hospital tickets issued to General Hospital out-patients	1,000
Cases sent to General Hospital (3rd class)	4
" " " " " (free)	19
" " " Convalescent Home	247
" " " Whashing Road (convalescent)	41
" " " Country Hospital (free)	4
Ambulances used	47
Infectious cases dealt with—scarlet fever	1
" " " " chicken pox	2

CHINESE POLICE HOSPITAL.

The use of the old Victoria Nursing Home as the Chinese Police Hospital worked quite satisfactorily on the whole, especially with regard to the overcrowding which began to be serious in the old Chinese Police Hospital. During the summer months many cases of dysentery were transferred to the Chinese Isolation Hospital.

The out-patient department was very busy during the later months of the year, as, in addition to the ordinary outpatients, the whole of those members of the Police Force and Fire Brigade, who had not been vaccinated or inoculated during the last two years against smallpox and the typhoid-paratyphoid fevers underwent these preventive measures. A considerable number of recruits for the Police, Fire Brigade and other Municipal Departments were also examined as to fitness. Those passed fit were also vaccinated and inoculated.

The Prisoners' ward was full for most of the year, although it was reserved almost entirely for prisoners requiring major operations.

The average number of days off duty sick in the Chinese Police Force for the last five years is as follows:—

1925 = 6.5, 1926 = 6.2, 1927 = 6.8, 1928 = 6.17, 1929 = 5.7.

The total number of admissions during the year was 1,748, consisting of 1,019 Chinese police, 243 prisoners, and 486 Municipal employees other than Police.

The number of admissions of prisoners was 243 compared with 234 last year.

Tuberculosis.—7 Chinese police were invalided on account of this disease.

Venereal Disease.—There was a decrease of 5 in the number of cases of gonorrhoea and increase of 17 in those of syphilis.

Communicable Diseases:—

Disease.	*Cases admitted.*	*Died.*	*Transferred to Ch. Isolation Hospital.*
Scarlet fever	2	—	2
Diphtheria	3	—	3
Cholera	7	2	4
Dysentery	125	—	34

Operations.—Altogether 138 operations were performed including several cases of abdominal bullet wounds.

Examinations as to fitness for services:—

Chinese Police recruits examined were 1,010, of whom 672 were passed as fit and 203 were passed subject to re-examination.

Fire Brigade recruits examined were 166, of whom 118 were passed as fit and 44 were passed subject to re-examination.

Chinese candidates for employment other than the above were 369, of whom 253 were passed as fit and 87 passed subject to re-examination.

Most of the routine laboratory work was done in the clinical laboratory of the hospital by one of the Chinese Medical Officers, and altogether 2,176 pathological specimens were examined.

INDIAN POLICE HOSPITAL.

This building, adapted from a private house, serves its purpose, but it will be a great advantage when the Police Hospitals are combined in the new Municipal Police Hospital now under construction in Ward Road.

During the summer months the hospital was kept quite full owing to the large number of cases of dysentery, but after the decline of that disease the demand for beds diminished, although there was still difficulty in isolating cases of suspected communicable disease.

Until the weather became too inclement, the mat shed was used for patients suffering from Tuberculosis, who were awaiting repatriation to India, but later these were moved to the verandah on the top floor.

Vaccination and inoculation of Indian Police and Warders against smallpox and the typhoid-paratyphoid fevers kept the Chinese Medical staff very busy in the Out-patient Department during the early summer months, and in November the staff had to be increased in order to cope with the examination of a large batch of Indian police and warder recruits from India. The wives and children of Indian police and warders were again treated in the Out-patient Department, and referred elsewhere for In-patient hospital treatment when necessary.

There were two deaths, one in the case of a warder suffering from tuberculous peritonitis and one of a Havildar Major, from bullet wounds of the abdomen.

There was an increase in the numbers of patients treated during the year in comparison with the numbers for 1928:—

	1928.	*1929.*
Admissions to Hospital	576	504
Attendances at Out-patient Clinic	5,304	5,699

The average number of days off duty sick of the Indian Police during this year was 9.1 compared with 11.4 in 1928.

Invaliding—Altogether 23 men were invalided out of the service during the year, 11 of whom were on account of Tuberculosis.

Communicable Diseases:—

Cholera	3
Diphtheria	4
Mumps	1

Four cases of benign tertian Malaria occurred.

Venereal Diseases.—Gonorrhoea—23, Syphilis—15, Chancroid—4. Anti-syphilitic treatment:—N.A.B. 261 doses, Mercurosal 378 doses, Bicreol 51 doses.

Operations.—Altogether 38 surgical operations were performed.

MEDICAL EXAMINATION FOR EMPLOYMENT.

POLICE & WARDERS			WATCHMEN & OTHERS		
Fit	Unfit	For re-examination	Fit	Unfit	For re-examination
101	7	27	92	17	25

WARD ROAD GAOL.

The completion of a combined Police & Gaol Hospital at Ward Road, in the near future, will be an enormous improvement on the present hospital accommodation for Chinese prisoners. The increase in numbers in the Gaol, where overcrowding was extreme last year, has resulted in a state of affairs which is decidedly unsatisfactory. Generally speaking, the health of prisoners is fairly good when they are sentenced to a term of imprisonment, but since Pulmonary Tuberculosis is so rife, it is not surprising that many become worse during their detention, and the number of deaths from this disease is considerable: although the mortality among the convicts cannot be considered as high, the returns for diseases other than tuberculosis are almost negligible.

The Gaol was remarkably free from acute communicable disease, only one case of cerebrospinal fever and three cases of cholera being transferred for treatment to the Chinese Isolation Hospital. All serious medical cases and all surgical cases requiring major operative treatment were transferred temporarily to the Chinese Police Hospital where accommodation is reserved for them. The prisoners' diet, which was thoroughly investigated during 1928, proved to be adequate in the maintenance of health.

Venereal Diseases.—These diseases are very prevalent among newly admitted persons. For short term prisoners, mercurial and bismuth preparations are employed in place of the more expensive arsenical compounds, except in special cases. Altogether 1,222 cases of venereal disease were treated, being slightly less than for the year 1928.

Pulmonary Tuberculosis.—The extent of the overcrowding present in the Gaol is reflected in the numbers proved to be suffering from this disease. There were 173 new cases and 108 deaths.

The average population in the Gaol increased from 3,526 in 1928 to 4,464 in 1929. The death rate is 28.9 a thousand, an increase of 12.5 a thousand over that of 1928.

Pulmonary Tuberculosis was the chief cause of death during the year.

REFORMATORY.

The health of juvenile male offenders was very satisfactory. This is no doubt due to the fact that accommodation in the godown where they are detained is ample for present requirements, and it is possible for suitable exercise to be taken either indoors or in the open space outside. The numbers decreased in the early part of the year, but returned to over 70 in November and December. Full adult diet is given to all cases not under medical treatment.

The following cases were transferred temporarily to the Chinese Police Hospital:—

Inguinal Hernia	1
Malaria	2
Influenza	1
Ankylostomiasis	1
Fracture dislocation of elbow	1

There were no deaths.

AMOY ROAD GAOL.

There was no serious ill health amongst the prisoners, only two of whom had to be transferred for treatment to the General Hospital. One of these, after many weeks in hospital, was finally released on medical grounds.

The prison is still extremely overcrowded; many of the cells which are intended for one only having to hold three prisoners. Several boys under 16 admitted for various terms of imprisonment would have been better detained in a Reformatory. During their term of imprisonment as much as possible has been done to keep these out of contact with the other prisoners, and to assist them in continuing school work. The transference of well conducted prisoners to the cook house, a much sought after privilege, resulted in considerable improvement in the preparation of the food.

A Russian dresser was in daily attendance, and a Chinese Medical Officer made routine visits on alternate days, and at other times when necessary. A foreign doctor attended weekly for the purpose of inspecting the food, doing a complete round of the prisoners for complaints, examining newly admitted prisoners and seeing any cases requiring special attention.

The only serious medical trouble was with prisoners suffering from mental disorder. It was impossible to admit these to the already full Mental Hospital, and they were in consequence a source of perpetual trouble to the officials of the Gaol and to the Medical Officers, and created a problem which urgently needs solution.

Venereal Disease.—Altogether 27 cases of gonorrhoea, 6 cases of chancroid and 17 cases of syphilis were treated during the year.

Communicable Diseases.—There was almost complete freedom from communicable diseases. 1 case of Diphtheria was transferred to the Chinese Isolation Hospital until recovery.

During the year 381 committals were made.

Nationality	Males	Females
British	44	0
Italian	1	0
Netherland	1	0
Unregistered Foreigners	303	32
Total	349	32

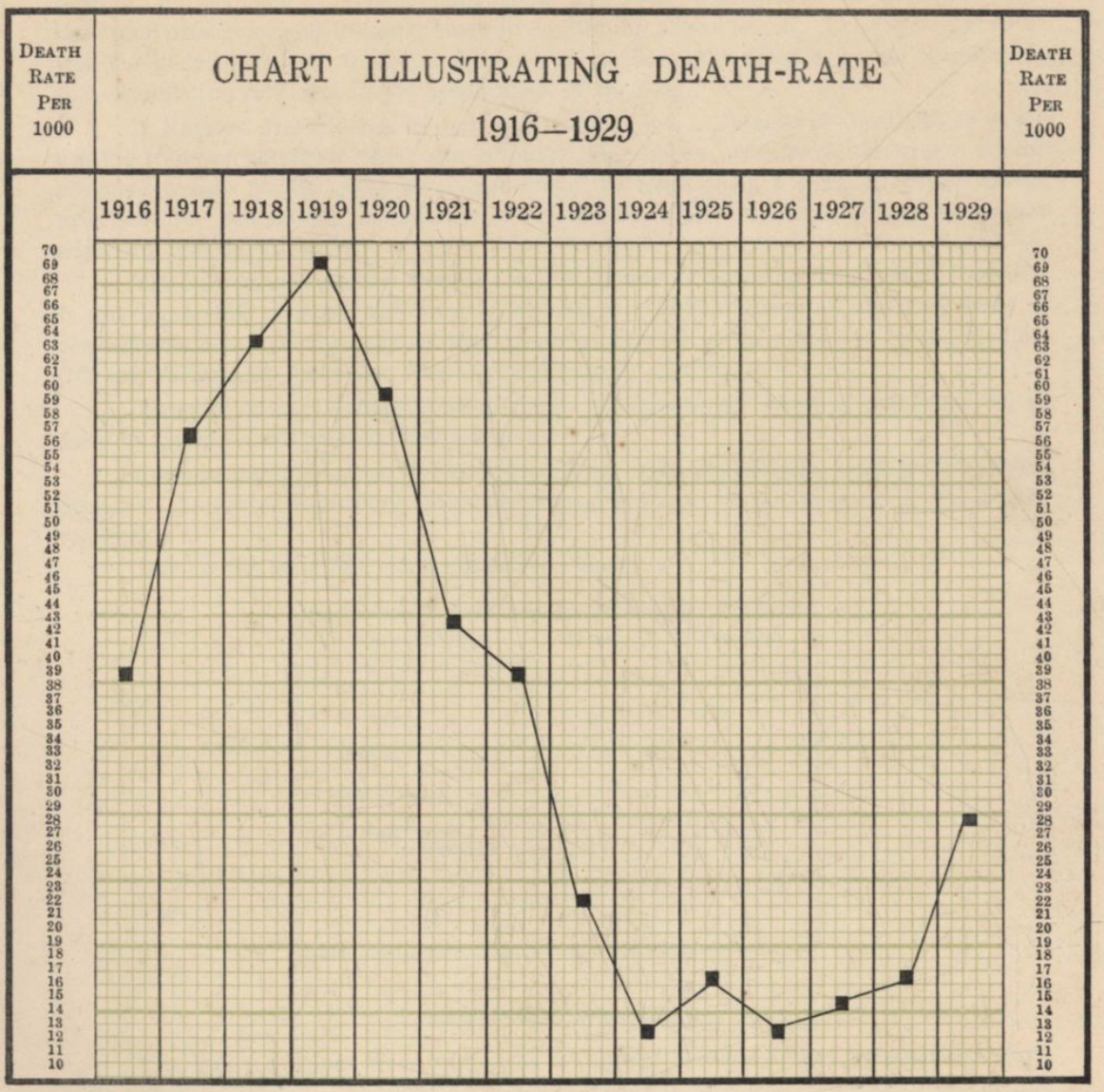
REMANDED PRISONERS.

The Police Stations were visited by a Chinese Medical Officer on alternate days, when minor ailments of remanded prisoners received attention. Serious medical and surgical cases were transferred for treatment to the prisoners' ward of the Chinese Police Hospital.

	Central	Louza	Sinza	West Hongkew	Hongkew	Harbin Road	Wayside	Yangtszepoo
January	61	42	38	70	15	62	36	14
February	41	32	21	24	8	22	24	8
March	61	60	48	22	21	24	33	13
April	80	79	53	20	22	62	27	24
May	74	48	71	24	18	75	34	22
June	64	49	42	39	26	29	23	17
July	72	85	64	35	19	66	48	34
August	41	54	26		23	49	31	27
September	50	125	45		13	73	56	33
October	109	95	65	22	15	75	57	21
November	39	33	46	35	16	65		16
December	47	69	48	71	8	48		17
Total	739	771	567	362	204	650	369	246

(*In those Stations registering no monthly cases, cell repairs were in progress.*)

MUNICIPAL GAOL



POLICE AND GAOL HOSPITALS.

	Indian Police Hospital			Chinese Police Hospital						Gaol Hospital		
				Admitted		Died						
	Admitted	Died	Invalided out of the Service	Police	Prisoners	Police	Prisoners	Police Invalided	Prisoners Released	Admitted	Died	Released
Smallpox	..	..	..	..	..	..	..	..	..	..	..	..
Cholera	3	..	..	7	..	2	..	..	..	3	2	..
Typhoid Fever	..	..	..	..	1	..	..	..	..	1	..	..
Paratyphoid Fever	..	..	..	2	1	..	..	..	..	..	..	..
Diphtheria	4	..	..	3	..	..	..	..	..	..	..	..
Scarlet Fever	..	..	..	2	..	..	..	..	..	..	..	..
Measles	..	..	..	1	..	..	..	..	..	..	..	..
Influenza	24	..	..	84	4	..	..	..	..	17	..	..
Tuberculosis	8	1	11	10	6	..	..	7	1	173	108	3
Malaria	4	..	..	39	4	..	..	..	..	37	..	..
Relapsing Fever	..	..	..	1	1	..	..	..	..	3	..	..
Lobar Pneumonia	1	..	..	5	1	1	..	..	..	..	..	..
Beri-beri	..	..	..	..	..	..	..	1	..	..	..	..
Syphilis	15	..	..	23	7	..	1	..	1	132	1	..
Gonorrhoea	23	..	..	38	8	..	..	..	..	790	..	..
Chancroid	4	..	..	6	..	..	..	..	..	300	..	..
Plague	..	..	..	..	..	..	..	..	..	..	..	..
Tetanus	..	..	..	..	..	..	..	..	..	..	..	..
Erysipelas	..	..	..	2	2	..	..	..	..	2	..	..
Typhus Fever	..	..	..	1	1	..	..	..	..	..	..	..
Dysentery	13	..	..	125	11	..	1	..	..	4	..	..
Sprue	..	..	..	..	..	..	..	..	..	..	..	..
Ankylostomiasis	24	..	..	16	4	..	..	..	..	3	..	..
Acute Diarrhoea	16	..	..	68	11	..	..	..	..	1	..	..
Chronic Diarrhoea	..	..	..	1	..	..	..	..	..	11	..	..
Abscess of Liver	..	..	..	..	..	..	..	..	..	..	..	..
Cancer	..	..	..	..	..	..	..	..	..	..	..	..
Appendicitis	..	..	..	3	4	..	1	..	..	5	1	..
Cardio-vascular diseases	..	..	1	1	..	..	..	2	..	5	1	..
Rabies	..	..	..	..	..	..	..	..	..	41	..	..
Bronchitis	78	..	2	20	..	..	..	..	..	6	1	..
Diseases of Kidney	2	..	..	3	..	..	..	..	..	1	..	..
Heatstroke	..	..	..	1	..	..	..	..	..	7	4	..
Suicide	..	..	..	..	3	..	..	..	..	57	..	..
Trachoma	..	..	..	4	..	..	..	..	..	266	..	..
Conjunctivitis	12	..	1	92	2	..	..	..	..	103	..	..
Fistula	..	..	..	2	..	..	..	..	..	86	..	..
Haemorrhoids	11	..	..	3	4	..	..	..	..	1037	..	..
Diesases of the Skin	15	..	..	65	5	..	..	..	..	..	..	..
Severe Injury	6	1	..	21	37	..	15	..	..	2	1	..
Slight Injury	29	..	..	52	30	..	..	..	..	134	..	..
Slight Ailments	80	..	..	72	12	..	..	..	..	1241	..	..
All other causes	132	..	8	132	84	1	..	7	2	854	10	1
Total	504	2	23	1019	243	4	23	17	4	5322	129	4

	Indian Police	Chinese Police	Prisoners
Number of Out-patients	5,699	8,752	40,561
Number of Out-patients—Miscellaneous	1,062	3,463	1,549
Number of In-Patients—Miscellaneous	75	486	—
Average number of days off duty sick	9.1	5.7	—
Average strength of Force	875	2,921	—
Vaccinations at Police Hospitals	1,192	4,662	—
Vaccinations at Gaol	—	—	8,723
T.A.B. Inoculations at Police Hospitals	1,375	7,783	—
Admitted to Gaol	—	—	8,621
Average number in Gaol	—	—	4,464
Average number in Reformatory	—	—	58

AMBULANCE SERVICE.

This service has developed considerably, and there are now 6 motor ambulances and 3 hand ambulances. In September one motor ambulance was transferred to a sub-

station at the Country Hospital, and direct telephonic communication was established between the Country Hospital and the Central Call Office situated in the Mental Hospital.

As in former years, one ambulance was reserved specifically for cases of communicable disease. It will soon be necessary to reserve 2 ambulances for this purpose.

Ambulance No.	*Journeys.*	*Miles.*
1	385	3,678
2	354	2,939
3	716	3,606
4	445	3,608
5	595	4,618
6	nil	nil
Total	2,496	18,449

VENEREAL DISEASES CLINIC.

The number of patients applying for treatment showed a gradual increase. The treatment of seafarers, the main object of the clinic when originally instituted, has become a very small part of the work done, a large proportion of all patients being destitute Russians. The nature of the source of infection serves to show the difficulty of any attempt to secure satisfactory control:—

Chinese Prostitutes	75%
Russian Prostitutes	12%
Other Nationalities	13%

The following table gives the number of cases treated:—

Cases of Syphilis	101
„ „ Syphilis-Gonorrhoea	18
„ „ Gonorrhoea	311
„ „ Chancroid	242
Other Diseases	145
Total	817

Treatment by diathermy was given 507 times.

Total attendance for treatment during the year—24,648.

NATIONALITIES OF PATIENTS ATTENDING V.D. CLINIC DURING 1929.

American	13	Japanese	19
British	26	Korean	10
French	2	Russian	451
German	12	Tartar	31
Indian	72	Other Nationalities	181
		Total	817

NUMBER OF PATIENTS.

	Syphilis	Syphilis & Gonorrhoea	Gonorrhoea	Chancroid	Observation	Treatments	Attendances
January	4	0	30	11	15	208	2,104
February	7	0	26	23	22	222	2,040
March	8	0	30	18	17	243	2,035
April	7	3	34	20	3	231	2,168
May	18	3	20	16	6	205	2,270
June	10	2	26	18	6	201	2,114
July	11	4	23	19	5	181	2,034
August	9	3	28	26	10	191	1,871
September	8	0	34	22	20	199	1,862
October	8	0	20	29	23	181	2,164
November	6	2	21	22	8	182	2,017
December	5	1	19	18	10	178	1,969
Totals	101	18	311	242	145	2,422	24,648

RESIDENTIAL DISTRIBUTION OF PATIENTS.

	International Settlement	French	Chinese Districts
January	38	20	0
February	42	14	16
March	55	11	3
April	48	12	2
May	50	10	1
June	47	12	1
July	46	12	2
August	51	13	2
September	64	15	2
October	51	21	2
November	47	10	2
December	39	10	2
Totals ..	578	160	35

TUBERCULOSIS CLINIC.

This Clinic has now completed its third year of existence and has thoroughly justified the whole of the expense and trouble expended on it, filling as it does an essential need in the life of the poorer section of the community. With the opening of the new Tuberculosis Sanatorium in Hungjao Road, the chain of treatment facilities, Clinic, Hospital and Sanatorium, has been lengthened and only needs a post-sanatorial work centre, the greatest problem of all, to make it complete.

The clinic is available for the use of any poor person attending with the prescribed card from a doctor, for diagnosis, observation or treatment.

The number of new patients increased by 16%, and the total increase was 25% on last year, showing that the facilities offered by the Clinic for the care and treatment of Tuberculosis are becoming more widely known and appreciated, both by the general practitioners and the people of Shanghai.

A number of pre-tuberculous children who are regularly examined, have been sent to the King's Daughters' Society Convalescent Home at Hungjao. These, in all instances, greatly benefited by their stay out of Shanghai, under much better conditions than in their homes.

Many needy and deserving cases were given help in the form of food, clothes and money by the various Charity Organisations, and some were sent away to better climes where their prospects of permanent cure and subsequent usefulness are greater. Unfortunately many cases are seen at the Clinic for the first time when the disease is in an advanced stage, or the patients in a dying condition, when there is very little prospect of cure. This necessitated the retention of a dozen beds in the Isolation Hospital for cases unsuitable for treatment at the Sanatorium.

As in previous years, the patients were visited periodically in their homes by the Clinic Nurse and Inspector; home conditions examined, and disinfection carried out when necessary. Simple instruction in personal hygiene and rules of health are given and contacts, especially other members of the patient's family, are invited to attend

the clinic for examination. Certain cases too ill to attend the clinic were visited and examined in their homes by the doctor in charge of the clinic, and admission to hospital arranged where possible. The value of the treatment out of hospital of many of the cases is small owing to lack of proper food and appalling living conditions. This social problem of entirely destitute invalids, friendless and unable either to find work or to do it, is urgently in need of solution.

TABLE A.

PATIENTS ATTENDED AND EXAMINED AT THE CLINIC IN 1929.

	M	F	Total
New cases	113	59	172
Cases from previous years attending during 1928.	62	64	126
		Total	298

TABLE B.

MONTHLY ATTENDANCE.

	Cases Attending.	Total Attendances
January	65	112
February	60	85
March	63	98
April	62	107
May	65	103
June	69	97
July	60	90
August	61	91
September	60	84
October	61	102
November	59	95
December	56	75
Total		1,139

TABLE C.

DIAGNOSIS OF NEW CASES.

Pulmonary tuberculosis	84
Other conditions	4
Pre-tuberculosis	28
Non-tuberculous	56
Total	172

TABLE D.

	M	F	Total
Patients removed to Isolation Hospital	55	28	83
Patients sent to Convalescent Home	16	13	29

TABLE E.

DISTRIBUTION OF THE PATIENTS IN SHANGHAI.

International Settlement	202
French Concession	76
Outside Limits	20
Total	298

TABLE F.

DISTRIBUTION OF THE PATIENTS IN THE SETTLEMENT.

	M	F	Total
Northern District	39	34	73
Eastern „	53	42	95
Central „	9	1	10
Western „	20	4	24
		Total	202

TABLE G.

NATIONALITIES.

	M	F	Total
American	—	3	3
Armenian	1	1	2
British	3	5	8
Bulgarian	1	—	1
Chinese	4	2	6
Filipino	2	1	3
German	1	—	1
Greek	1	2	3
Indian	15	8	23
Japanese	5	7	12
Jugo-Slavian	1	—	1
Korean	11	3	14
Latvian	2	1	3
Lithuanian	2	—	2
Portuguese	7	16	23
Polish	4	4	8
Rumanian	2	1	3
Russian	104	64	169
Serbian	1	1	2
Spanish	—	1	1
Tartar	5	—	5
Turkish	—	2	2
Other Nationalities	3	—	3
		Total	298

TABLE H.

AGE DISTRIBUTION OF THE PATIENTS.

Age periods	M	F	Total
1—10	19	16	35
10—20	20	33	53
20—30	37	30	67
30—40	57	27	84
40—50	37	8	45
50—60 or over	5	9	14
		Total	298

TABLE I.

NOTIFIED TUBERCULAR CASES REGISTERED AND INVESTIGATED BY THE CLINIC INCLUDING THE INSPECTION OF LIVING CONDITIONS.

	M	F	Total
In 1929	113	55	168
In previous years	390	189	579
		Total	747

TUBERCULOSIS SANATORIUM.

The Sanatorium was opened on August 20th, and has proved of great value in the treatment of tuberculous patients on Sanatorium lines, but more has still to be done to keep the patients occupied and to engage them in some sort of productive labour. The male side has been full from the first, but there have always been a few vacancies on the female side. There was little demand for first and second class accommodation, only three such cases having been admitted for short periods only, whilst waiting transfer to a more favourable climate.

There is considerable difficulty in finding suitable employment for destitute patients who often make good progress under Hospital and Sanatorium treatment and they frequently drift back some short time after their discharge in a far worse state than before so that the whole routine of treatment must be gone through again with a smaller chance of success than at first.

MEDICO-LEGAL.

Reports of external injuries, wounds, and other conditions, were submitted in the case of 744 bodies examined at the Public Mortuary, while at the request of the Provisional Court, 49 autopsies were performed. During the year 634 inquests were held.

LECTURES ON FIRST AID AND HYGIENE.

Lectures and demonstrations were given as before to Chinese Police recruits, and two full courses were also given to foreign recruits. This instruction is to be extended

TUBERCULOSIS HOSPITAL—HUNGJAO ROAD.

to the sub-officers of the Fire Brigade early in 1930 and should prove of great benefit both to the officers and men of these two Departments.

The course to the Chinese is undertaken by a foreign-trained Chinese medical officer, and to foreigners by the foreign medical officers.

Medical Examination of Foreign Candidates for Municipal Employment.

These examinations are carried out on two mornings of the week at the Branch Health Office, 23 Hankow Road. Chinese candidates of the higher grades are also examined there, and others at the Municipal Police Hospitals.

The following are the results of examinations 1929:—

Examined and found physically fit	156
Examined and recommended for re-examination at a later date	5
Rejected as unfit	7

VI.—SANITATION.

The Sanitation Division is chiefly concerned with the investigation of communicable disease and disinfection; the verification and registration of Chinese deaths; vaccination against smallpox; plague prevention; mosquito and fly reduction; inspection of licensed and other premises; public health education and publicity; public swimming baths, investigation of public complaints and the abatement of nuisances.

The sources of infection of 710 cases of communicable diseases notified amongst Foreigners, and of 4,918 Chinese cases were enquired into by Health Inspectors.

Chinese cases are rarely notified but are usually discovered amongst the deaths reported by refuse coolies as having occurred in their districts.

Enquiry was also made into the causes of 13,642 Chinese deaths, and 58,213 persons were vaccinated of whom 56,016 were Chinese and 2,197 Foreigners.

Investigation of 876 complaints from the Public were made and remedies applied; in addition 30,926 insanitary conditions were discovered and remedied.

Branch Health Offices.

There are 14 Branch Health Offices of which two are rented, the remainder being the property of the Council.

These are not only centres for the distribution of information on public health, but are used, as will be seen in the return below, as Vaccination Centres.

Branch Health Offices				Vaccination Returns	
District	No. of Branch	Address	Telephone Number	No. of Vaccinations	Total
Eastern	1	2 Sungpan Road	50691	2,168	
	2	40 Yangchow Road	50271	3,051	
	3	57 Ward Road	50171	8,026	
	4 & 5	10 Tungchow Road	40273	7,258	20,503
Northern	1 & 2	48 Yalu Road	43035	5,257	
	3	190A N. Szechuen Road	40276	3,888	
	4	100 Tsepoo Road	40277	7,161	16,306
Central	1	23 Hankow Road	14273	4,306	
	2 & 3	Town Hall	14274	3,652	7,958
Western	1	M. 59 Avenue Road	30447	5,606	
	2 & 3	28 Markham Road	30449	5,162	
	4	368H Yu Yuen Road	27346	2,678	13,446
					Total 58,213
Eastern		Hongkew Market	40274	} Food Division only	
Northern Ctl. & West.		Elgin Road Market	40231		
		1 Honan Road	13039		

Vaccination.

The steady increase of vaccination and revaccination is very satisfactory.

There is a tradition among the Chinese that "The Festival of the Birthday of the Flowers" in March, is a day of good omen, and happy auspices, and peculiarly favourable for protection against smallpox, so that this is the chosen day for bringing their babies to be vaccinated.

The result is that many babies are not vaccinated as early as they should be, but the growth of education may lessen the power of this tradition.

The number of vaccinations performed at Branch Health Offices was 58,213, which constitutes a record.

VACCINATIONS CARRIED OUT FOR THE YEAR 1929

		January	February	March	April	May	June	July	August	September	October	November	December	Grand Total 58,213
Chinese	Infants	711	723	10,321	6,286	1,436	1	0	0	0	3,004	2,035	876	
	Children	1,504	667	8,307	7,650	2,004	0	0	0	0	1,848	1,121	391	
	Adults	1,402	830	1,980	1,661	486	24	0	0	0	300	173	275	
	Total	3,617	2,220	20,608	15,597	3,926	25	0	0	0	5,152	3,329	1,542	
Foreigners	Infants	50	16	9	7	5	0	0	0	0	13	11	9	
	Children	638	149	43	13	11	0	0	0	0	22	30	14	
	Adults	686	236	86	18	18	0	0	0	0	50	27	36	
	Total	1,374	401	138	38	34	0	0	0	0	85	68	59	
Grand Total		4,991	2,621	20,746	15,635	3,960	25	0	0	0	5,237	3,397	1,601	

PLAGUE PREVENTION WORK.

PLAGUE PREVENTION

	District				Total
	Eastern	Northern	Central	Western	
Rats found dead and sent to the Laboratory for examination	6,344	7,203	3,011	5,320	21,878
Number of traps in operation	1,262	2,000	600	40	3,902
Number of rats trapped and burnt	17,331	26,391	9,839	171	53,732

No plague infected rats, human cases, or vaccinations against plague.

Disinfection Station.

During the year 184,443 articles of clothing, bedding, etc., were disinfected by steam and 4,757 by formalin. One or other of the two Steam Disinfectors was in daily use throughout the year and often it was found necessary to use both at the same time.

The "Thresh" current steam disinfector was replaced by a modern high pressure steam disinfector made by Messrs. Manlove, Alliott & Co., Ltd., which has so far given satisfaction. A vertical steam boiler was also installed so that both disinfectors could be supplied with steam from one boiler.

There are six disinfection vans now in use, one for foreign disinfections, one for each of the four sanitary districts into which the Settlement is divided, and one in reserve.

The disinfection staff consists of five squads of three men each, one squad for each sanitary district and one squad for disinfection at foreign houses and hospitals. Each squad is provided with disinfectant spraying pumps, formalin sprayer, pails, mops, cleaning cloths, fumigation apparatus and overalls.

Chinese Dwellings.

The year has been marked by demolition and rebuilding, with the very satisfactory result that the numerous slum areas have been cleared away.

New houses are being built in semi-foreign style and more than two stories high, indicating a greater desire for comfort, and a higher standard of living amongst the people. The advantages are obvious, inasmuch as the higher houses are separated by wider alleyways and a given area can accommodate a greater number of persons without the previous overcrowding. The present shortage of housing facilities in the Settlement will be relieved by this development, and in time the many squatter huts and undesirable dwelling places which abound in the Settlement may disappear.

The development of a civic spirit in cities, the demand for a higher standard of living generally and the desire for the amenities of civilisation, gradually lead to the disappearance of alleyways and hovels and their replacement by better houses and wider roads, and consequent improved sanitation.

New Chinese Houses Built in 1929.

Central	455
Northern	513
Eastern	1,794
Western	2,520
	5,282

Slum Houses Demolished.

Eastern	734
Northern	423
Central	889
Western	681
	2,727

Foreign Dwellings.

The construction of apartment houses and large hotels continued this year, and the tendency is for increasing numbers of the foreign population to take up this form of residence.

House Refuse.

Serious difficulties were encountered by the Public Works Department in the disposal of house refuse, by the refusal of the Chinese Public Health Authorities to allow dumping of refuse from the International Settlement on an outlying site in an unpopulated region across the Whangpoo, where refuse from Greater Shanghai and from the French Concession was already being dumped.

This was a deplorable instance of imperilling public health and welfare for the sake of political expediency.

It became necessary to dump the refuse within the boundaries of the Settlement and only the adoption of intensive measures of Fly-prevention by the Public Health Department in close co-operation with the Public Works Department prevented serious detriment to the public health and welfare.

Over 400 mow of swampy and low-lying land were filled in with nearly 300,000 tons of refuse, thus eliminating the breeding places of myriads of mosquitoes with undoubted benefit to the amenity and health of the community.

Mosquito Reduction.

Although expenditure on mosquito reduction was relatively small, nevertheless a considerable amount of work was done.

Mosquitoes in Shanghai are not only the cause of great irritation and discomfort, but are a serious menace to health since they are known, and have been known for many years, to transmit malaria of the benign tertian type.

As long ago as the 1840's and the 1850's, Dr. Lockhart and Dr. James Henderson wrote about Malaria in Shanghai, and in 1899, Dr. Stanley in the Annual Report of the Public Health Department wrote of Malaria, and in 1902 said "there is a considerable amount of malarial fever, mostly of the benign tertian type, contracted in and around Shanghai."

This fact has been mentioned in all recent Annual Reports but is only just beginning to be realised by the Public.

Eleven species of mosquitoes have been found in Shanghai and have been described in an interesting and valuable paper by Lieutenant-Colonel W. P. MacArthur, D.S.O., in the "Journal of the Royal Army Medical Corps," April 1929.

They are *Anopheles hyrcanus, Armigeres obturbans* (=*Ventralis*), *Culex mimeticus, bitaeniorhynchus, tritaeniorhynchus, C. pipiens, C. fatigans, Lutzia fuscana, Ades* (*Stegomyia*) *albopictus, A.* (*S*) *chemulpoensis.* There are probably others still to be recorded.

The *Anopheles hyrcanus* is a malaria bearing mosquito and is found in and around Shanghai.

Colonel W. P. MacArthur and his colleagues observed that the *Anopheles hyrcanus* avoided airy and well-lit houses furnished with fans, but swarmed into the army tents.

This explained the prevalence of malaria among the troops billeted in tents at the time, and its rarity elsewhere.

The problem of mosquito reduction is a peculiarly difficult one in Shanghai which merges into low-lying country beset with stagnant ponds, swamps and paddy fields, sluggish creeks and kongs of all descriptions.

The normal range of flight of a mosquito is about a mile and of the Anopheles species about half a mile, but they may be carried a considerable distance by a steady breeze, so that it is obviously impossible, under present conditions, to get rid of them entirely.

The total abolition of mosquitoes in and around Shanghai would need the closest co-operation between all authorities, and the expenditure of vast sums of money.

The addition of castor-oil to the mosquito mixture of crude petroleum and kerosene for spraying stagnant water, where mosquitoes breed, considerably increased the efficiency of the spray, and enabled a greater area to be treated for the same cost.

Several thousand of the fish which are natural enemies of mosquito larvae, including Gambusia 4,000, Henli Minnow 300, and Local Minnow 14,000 were distributed among ponds where oiling was impracticable.

Fly Reduction.

Most of this work was done in connexion with refuse dumps in the Settlement and kongs throughout the agricultural districts.

In the Eastern and Western Districts 930 kongs were emptied, 3,191 were treated with lime every ten days throughout the year, and 720 treated weekly during the summer.

Laundries.

Routine inspection and disinfection of licensed laundries were carried on throughout the year.

There are a number of unlicensed laundries on the borders of the Settlement in which conditions are squalid and insanitary, and residents are advised to ascertain whether the laundries they patronise are licensed and therefore conform to Municipal Regulations.

Tailors' Shops.

Licensing of Tailors' Shops has been extended to include the majority of those in which clothes of foreign style are made, and there are approximately five hundred of these under sanitary supervision.

The Sanitary Record of licensed premises can always be seen by customers on the Public Health Department's Inspection Sheet, displayed with the Licence, in a prominent position in the premises.

Chinese Lodging Houses and Hotels.

There has been considerable improvement in Chinese Lodging Houses and Hotels of all grades; during the last few years several new Chinese Hotels have been built in foreign style, containing all the latest modern conveniences.

Routine inspection and monthly disinfection of the lower grade of common lodging houses was carried on as usual, and there was no outbreak of communicable disease.

The licensees themselves took an active interest in the sanitation of their premises.

All Foreign Boarding Houses are now under the sanitary supervision of the Public Health Department and special measures enforced for the prevention of intestinal communicable disease.

Publicity.

The pamphlet "Health Hints," which was published last year, was amplified and translated into Chinese.

This edition contains special sections dealing with the sanitation and hygiene of Chinese life, especially with regard to food.

The pamphlet on "Rabies" is now available in English, Russian, Japanese and Chinese.

Chinese teachers continue to give lectures on personal hygiene, vaccination against Smallpox, the prevention of Tuberculosis and intestinal diseases, in the Branch Health Offices and Schools.

Cinematographic demonstrations illustrating the advantage of vaccination against smallpox, the transmission of Cholera and other intestinal diseases by infected food and drink, the prevention of breeding of mosquitoes and other subjects of importance in Public Health, are given at the Branch Health Office (Central District), 23 Hankow Road.

Smoke Nuisance.

The smoke nuisance still persists, though it has been the cause of a smaller number of public complaints.

It arises principally from steamships and steam launches on the river and from the greater industrial works, but is aggravated by a large number of small factories which in many instances are adapted premises totally unsuitable for their purpose.

A smoke-laden atmosphere is detrimental to health in the following ways:—

1. By causing a gradual deposit of carbon in the lungs, which changes their natural pearly white colour to a dirty grey and causes the healthy tissues to become fibrous; the consequence is that the air spaces are encroached upon, leading to emphysema, a chronic disease of the lungs, also resistance is lowered to such diseases as Bronchitis, Pneumonia, Influenza and Tuberculosis.

2. By shutting off the direct rays of the sun which are known to be of first importance for vitality, growth and health.

Lack of sunlight is a serious predisposing cause of rickets and tuberculosis in all its forms, and sunlight often has a magical effect in curing these diseases. Sunlight is Nature's great antiseptic, and rapidly kills most disease producing organisms, including those of pneumonia, influenza and tuberculosis.

3. By producing a disagreeable and depressing effect on outdoor conditions, so that children and grown-up people are driven from out-door exercises and games to indoor amusements and occupations.

In the words of Dr. Leonard Hill, one of the greatest living authorities on the subject—

"The indoor life, with its stagnant, over-warm atmosphere, has a most serious effect on human vitality, causing the fires of life to burn weakly, making the breathing shallow, the circulation feeble, the appetite poor, and digestion impaired, reducing strength and comeliness, and diminishing vigour and the enjoyment of Life. We have cleaned up our streets, our drainage, our cesspools, our houses, but the one thing we have not done is to clean up our air."

4. Smoke has a destructive influence on vegetation, so that fresh green vegetables, rich in vitamins, cannot be grown in smoke-laden atmospheres.

Lack of vitamins causes malnutrition, and predisposes to tuberculosis, rickets, decay of teeth, disorders of the gums, with consequent broken health, and often untimely death.

New York has a pellucid atmosphere because it is a general offence there to burn soft coal.

A pure atmosphere is as essential for health as a pure water-supply.

A pall of smoke over a city is a blot on the escutcheon of its administration.

Compulsory powers to deal with the matter are quite inadequate in Shanghai at the present time.

Swimming Bath and Open Air Swimming Pool.

The Swimming Bath opened on May 15 and closed on September 30, and was used by 15,682 persons during the Season.

The water was chlorinated nightly under foreign supervision, and a satisfactory standard of purity was maintained.

The Pool opened on May 22 and closed on September 30, was used by 69,755 persons and at times was considerably overcrowded.

The water underwent continuous filtration and chlorination and a satisfactory standard of purity was maintained.

In view of the great popularity of the Pool, especially among the Chinese, it is desirable that another be provided in the Western District, an ideal site being the Jessfield Park.

The following revised Regulations for the control of the Pool were issued:—

MUNICIPAL NOTIFICATION.

No. 3845.

Open-Air Swimming Pool.

Notice is hereby given that the following revised regulations governing admission to the Open-Air Swimming Pool will become effective from May 22, 1929, from which date the Pool will be open for use by the Public:—

(1). The Pool will be opened to the public from 6 a.m. to 8 p.m. during the Season.

(2). Admission fee twenty cents (silver) payable on entry.

(3). No children under twelve years of age will be admitted unless in charge of some responsible person.

(4). No person suffering from obvious communicable disease will be admitted.

(5). Women and children with long hair must wear proper bathing caps.

(6). Bathers must take a shower bath before entering the water, and suitable bathing costumes must be worn.

(7). Spitting is prohibited on the premises or in the Pool.

(8). Personal property including bathing costumes, towels and valuables may be left in charge of the attendant, but no responsibility will be taken for loss or damage.

(9). No responsibility will be taken for injuries received by any person while using the premises.

(10). No intoxicating liquor will be allowed on the premises.

(11). Breach of any Regulation will be followed by instant expulsion.

(12). The Council reserves the right to refuse admission to any person.

By Order,

S. M. EDWARDS,
Secretary.

Council Chamber, Shanghai, May 2, 1929.

GENERAL SANITARY WORK.

Vaccinations against Smallpox	58,213
Enquiries into Foreign cases of communicable disease	710
Enquiries into Chinese cases of, and deaths from communicable disease	4,968
Total enquiries into Chinese deaths	13,643
Rooms disinfected after communicable disease	14,312
Articles disinfected by steam, etc.	173,324
Houses cleansed and limewashed	1,838
Exposed coffined and uncoffined corpses removed and buried	3,663
Smoke nuisances suppressed	147
Offensive trade processes amended	26
Beggar boats removed	12
Complaints of insanitary conditions received from the public and investigated	876
Insanitary conditions reported by the Public Health Department and investigated	30,926
Written intimations issued for sanitary amendment	1,574
Second written intimations issued for sanitary amendment	26
Licence applications received and dealt with	208
Total inspections of licensed and other premises, etc.	63,443
Prosecutions	61

PROSECUTIONS.

Offence	No.	Penalty
Breach of Laundry Licence Conditions	10	Fined $2 — $5.
Breach of Tailor's Shop Licence Conditions	35	Fined $2 — $5.
Breach of Lodging House Licence Conditions	13	Fined $2 — $20.
Breach of Bye-law XXXIV, doing business without a licence, Tailors and Laundries	2	Fined $3.
Breach of Bye-law XXVI, pouring ordure down drain	1	Fined $2.

VII—FOOD.

The year was again one of considerable activity. There was a further improvement in the general condition of licensed dairies and in the standard of milk production. Special attention was given to hotels and eating houses, and the standard generally improved. The markets were used more and the receipts from fees higher. The Municipal Abattoir was taxed to its utmost capacity and registered a record in the number of animals slaughtered and revenue received. The first year of pig inspection was completed satisfactorily.

Aerated Water Factories.

Four factories are licensed for the manufacture and sale of aerated waters. Three are situated in the Eastern District and one in North Szechuen Road Extension. The general condition of licensed factories of this class is good, and the quality of the products satisfactory. Twenty specimens from licensed premises were taken for bacteriological examination. All except one were within the standard required. Aerated waters manufactured on unlicensed premises, situate outside the Settlement, were found on sale in shops and on stalls within the Settlement and the practice stopped wherever noted. Action was also taken against vendors who attempted to sell aerated waters and cold drinks under insanitary conditions.

Bakeries.

Close attention was given to the condition of licensed bakeries and the methods of production employed. Endeavours were made to have premises constructed on a standard plan, but it was found difficult to adapt ordinary Chinese houses to the approved design. Bakeries require specially constructed buildings, having store, mixing room, oven and baking room, packing and despatching room, with facilities for washing and lavatory accommodation. Many applications for licences had to be refused on account of the premises not being suitable for the purpose.

The general standard in licensed bakeries shows some improvement, but more requires to be done before they can be considered altogether satisfactory. A quantity of bakery products, mostly biscuits, is brought daily into the Settlement from places not licensed by the Municipal Council. To check this, distributing tickets are issued for use by delivery coolies employed by licensed bakeries. A number of licensees were summonsed for breaches of licence conditions, the most common offence being that of selling bread improperly wrapped.

Dairies and Milk Supply.

When the Food Division was formed in April 1924, there were forty-two licensed dairies supplying dairy produce in the Settlement. Since that time twenty-nine licences have been withdrawn or cancelled—seven this year, and twenty-two previously. Sixteen new licences have been issued, including three this year, leaving a total of twenty-nine licensed dairies at the close of the year. Eight have Grade A Licences and twenty-one Grade B, the same number of Grade A as last year, but four fewer Grade B dairies. Twenty of the dairies are owned by Chinese, eight by Europeans and one by a Japanese.

Under Municipal Notification No. 3341, dated March 25, 1925, the period allowed for all dairies to comply with the Dairy Building Rules and Licence Conditions, expired on October 1. During the year, six dairies closed as they could not comply with licence conditions. Three of these went out of business completely, one joined in partnership

with an existing dairy, one was transferred to another dairy and one built new premises in another District. At ten others extensive alterations and improvements were made. All the cowsheds erected and reconstructed during the year were provided with the latest type of standings and fitted with modern yokes. Automatic drinking vessels were installed in some of them. All the dairies now have steam boilers connected to washing tanks, and sterilizing chambers. All have bottle washing rooms separate from milk bottling rooms and a good number have refrigerating chambers. Milk bottles of an approved type are now in regular use. Unfortunately these are not of all one standard capacity, most dairies preferring to use the American pint of 16 ozs. A few others use the English type of 20 ozs. Discs and hoods are provided on all bottles.

With the great improvement in dairy premises, there will be more time to devote to the actual methods of milk production and handling of milk. A considerable improvement is already noted but frequent inspection and constant watching is necessary to keep the Chinese dairyman anywhere near the requirements of the Public Health Department. In certain quarters there is a spirit of competition and a pride in having premises, plant and equipment which will evoke favourable comment from those qualified to give an expert opinion. There are exceptions, however, to this desirable state of affairs and in some cases ceaseless effort or drastic action will be necessary before it is realized that the community demands, and is entitled to have, only clean, pure, wholesome milk, from healthy, clean cows handled and kept under sanitary conditions.

Eight dairies have Grade A licences, the same as last year. One dairy was reduced to Grade B for non-compliance with licence conditions. Although there are fewer dairies now licensed, those existing are larger and accommodate more cows than the old dairies.

Milk Samples for Analysis.

The purity and quality of milk supplied by licensed dairies continued to be of a high standard. More samples were taken for analysis during the year 1929 than during any previous year, the total from licensed dairies being a record number of 2,039 compared with 1,858 last year. The number of non-genuine samples from licensed dairies was 16 against 23 last year, or 0.78% and 1.23% respectively of the samples taken. Of the 16 non-genuine samples from licensed dairies 10 were adulterated by the addition of water in quantities of from 4%—23%, whilst 6 were deficient in fat in amounts varying from 5%—41%. Forty-nine samples were reported as being of poor quality either in respect of fat content or on account of low amount of solids-not-fat, compared with close on 100 last year.

In addition to the above, 24 samples were taken for analysis from unlicensed vendors, 13 of which, or 54.17%, were not genuine. 12 contained added water in quantities from 6%—25% and one was deficient in fat to the extent of 23%.

As it is such an easy matter to adulterate milk, especially by the simple addition of water, it is remarkable that the practice is not more common. The penalties imposed by the Provisional Court were on the whole heavier than last year, especially when it could be shown that the milk was also dirty or from unlicensed premises. Fortunately, the worst offenders have been eliminated during the last few years; the unlicensed dealers outside the Settlement require careful watching. On the whole, a high standard of purity is maintained by licensed dairymen, due to an improved sense of responsibility on the part of the licensee and to the elimination of constant offenders by the withdrawal of licences and closing of premises. Resort to the latter step in extreme cases of repeated adulteration has been found to be a strong deterrent. Frequent inspection and sampling assists in maintaining a high standard.

MILK SAMPLES 1929 SUMMARY.

Source	No. of Samples	Adulterated		Total	Poor Quality
		Added Water	Deficient In Cream		
Licensed Dairies	2,039	10	6	16	49
Unlicensed Dairies	24	12	1	13	0
Total	2,063	22	7	29	49

MILK SUPPLY 1929 SUMMARY.

Number of Licensed Dairies at end of year	Grade A	8	29
	Grade B	21	
Number of cattle in connection with licensed Dairies at end of year	Grade A	1,071	2,226
	Grade B	1,155	
Number of milk samples taken from licensed Dairies for analysis		2,039	2,063
Number of milk samples taken from Unlicensed Dairies for analysis		24	
Number of samples not genuine Licensed Dairies		16	29
Unlicensed Dairies		13	
Percentage of samples not genuine Licensed Dairies		0.78	1.4
Unlicensed Dairies		54.17	

Bacteriological Examination of Milk.

One hundred and eighty specimens of milk were taken for bacteriological examination compared with 139 last year, 99 were raw milks and 81 pasteurized. Of the raw milks 75 were within the standard. Of the 81 pasteurized milks, 65 or 80.3%, were within the standard. Of the total number of samples taken 22.2% were below the standard against 37% last year. 70% of the unsatisfactory samples were obtained during the three hot months of the year, namely, June, July and August, at which time particular care is absolutely essential in the production, handling and cooling of milk if the bacteriological count is to be kept low. Inspection of dairies from which unsatisfactory samples came showed the need for cleaner methods, improvements in sterilizing utensils and greater care in keeping milk cool.

Unlicensed Dairies.

There are still many insanitary unlicensed dairies just outside the Settlement and in Pootung. The owners of these places endeavour to dispose of their milk to people who reside outside the Settlement, to Indians who look for a cheap supply, to others who think they are being supplied from licensed dairies and surreptitiously to owners of licensed dairies to supplement shortage.

The milk supplied by unlicensed dairies is usually found to be adulterated and dirty. Of the number of unlicensed vendors caught selling milk in the Settlement the milk

was examined in 24 cases, 13 were found adulterated, or 54% against 63% last year; all were prosecuted at the Provisional Court and fined sums varying from $5—$100.

To discover unlicensed dairymen actually delivering milk is not easy. They mostly work at night or very early in the morning and are adepts at deception. Some carry bottles in coats with many pockets around their person, whilst others use bottles with labels from dairies previously licensed or have labels of the type required by existing dairies. Some have the audacity to mark the milk Grade A and others use stolen bottles from licensed dairies. Special Chinese police and foreign overseers are engaged, from time to time, in an endeavour to apprehend these unlicensed dairymen. Householders should make a practice of enquiring as to the source of the milk supplied to them. If there is any doubt about the origin of the milk, advice should be obtained from the Public Health Department.

Veterinary Examination of Dairy Cattle.

The names of 9 qualified Veterinary Surgeons are on the register as approved for the examination and certification of cattle at licensed dairies, an increase of one as compared with last year. Only 6, however, have been employed on this work.

Seventy-seven certificates were received certifying 5,709 examinations against 81 and 4,853 respectively last year. 324 animals were certified as suffering from one or other of the conditions noted in the schedule attached to the certificate. The tuberculin test was applied to a number of cows suspected of being affected with Tuberculosis and all those re-acting were slaughtered.

Conditions Noted on Certificates:

Indurated Udder	105
Tuberculosis	6
Retained Placenta	17
Mastitis	47
Glandular Swelling	20
Other Conditions	129
Total	324

Cattle Disease.

Rinderpest was again the cause of many deaths and rejections. Those dairies not taking the precaution of having animals immunised lost heavily. To replace losses, cows were imported from Japan, Manchuria and U.S.A., other animals were brought in from unlicensed dairies in Pootung and neighbourhood.

Particulars were obtained of 569 animals disposed of by dairy owners. Some of the animals died on the dairy premises, others were sent for slaughter to the Municipal Slaughter House or to knackeries.

Causes of Removal from Licensed Dairy Herds:

Rinderpest	178
Tuberculosis	86
Non-Productive	142
Anthrax	2
Other Conditions	161
Total	569

Food and Drink Stalls and Stands.

Large numbers of these small establishments added considerable work, particularly during the hot months. The sale of foodstuffs from stalls in public thoroughfares and alleyways cannot be regarded with favour in Shanghai owing to the constant exposure to contamination from dust, flies and dirt. Food and drink stalls should only be allowed where there is a public necessity for them. Most of the existing stalls are unsatisfactory in the sense that food is unduly exposed to contamination. Stalls frequently obstruct the alleyways in which they are usually placed and the owners have little or no regard for even the most elementary requirements of public health. During the hotter months of the year an intensive campaign was organised against the sale of contaminated foods and iced drinks from stalls, etc., and efforts were made to get rid of the worst offenders.

Food Shops—Chinese.

These are divided into two classes: Chinese foodshops and Chinese eating houses. The former group mostly deal in pork for Chinese consumption, Chinese dried foodstuffs, etc. All new shops are now required to conform to reasonable requirements before licensing. Pork sold in these shops is either prepared at private pig slaughter houses or the Municipal pig slaughter house, where inspection is made by Municipal Officers. The shops are also under the regular inspection of the District Inspectors. During the year, many Licensees were prosecuted for selling pork which had been rejected at the pig slaughter houses.

Chinese eating houses include eating houses or restaurants serving food prepared in Chinese style. There are a large number of these, many being unsatisfactory. Some also serve food in semi-foreign style. A higher standard than formerly is now being required and many premises have been greatly improved.

Food Shops—Foreign.

Foreign foodshops are placed under two classes. Class I, comprises butcher shops mainly patronised by the foreign community. Meat which has not been prepared and passed inspection at the Municipal Slaughterhouse is not allowed to be sold or kept in shops of this class, and this rule is generally observed by Licensees. During the year, however, a few cases where uninspected and unsound meat was kept had to be dealt with before the Provisional Court.

First quality beef prepared at the Municipal Slaughterhouse is marked with a circular stamp, bearing the words "KILLED MUNICIPAL SLAUGHTERHOUSE," while a similar inscription in triangular form is applied to mutton, pork and veal. The date on which the particular animal was slaughtered is also shown. Meat not equal to 1st quality is marked "2ND QUALITY." Meat not displaying a mark in the above-mentioned form has not been prepared at the Municipal Slaughterhouse.

In general, the condition of premises of this class is good, but in some cases improvements are necessary before they can be regarded as conforming to present day requirements for butcher shops. Most butcher shops have now installed their own refrigerating plants. A few new, well-fitted shops were licensed during the year in the Western District.

Foreign Foodshops, Class II, include those places usually known as "Compradore Shops." These premises are also under regular inspection, and in general, their condition is satisfactory. In individual cases, however, improvements are indicated, particularly in regard to ordinary cleanliness of shops and fittings, and in the methods employed in the handling of foodstuffs in bulk. Many of them have insufficient accommodation.

Fruit Shops and Stalls.

Premises of this class require constant attention, especially during the hot months in order to check the sale of bad, cut and contaminated fruit. A large number of prosecutions were undertaken and a large amount of cut and unsound fruit confiscated and destroyed.

Hawkers.

The enormous number of foodhawkers in the Settlement is a constant source of anxiety, and even with the assistance of Sanitary Police it is found impossible to deal adequately with and to control this class of trade.

The general methods adopted by food hawkers are well known to the Public, but some of their special practices are not, such as the storage of foodstuffs in bedrooms of dwelling houses, the use of dirty water for "freshening-up" of certain articles of food, the use, as a refrigerant, of the commodity known as natural ice, but more accurately described as frozen sewage. Hawking should only be permitted to meet a public need. Where market space is available all endeavours are made to get food dealers to use the markets provided, but hawkers will insist in frequenting the neighbourhood of Municipal Markets.

Hotels and Restaurants.

These premises are under regular inspection. The leading establishments are mostly in good condition from a structural point of view and also their methods of handling food, but in some cases improvement is desirable. Most of the Chinese hotels and restaurants are far from satisfactory. The kitchen and food preparation rooms are totally inadequate and many of them are so small that a good deal of the work of preparing food is done in an adjacent yard or alleyway. The recently constructed hotels are better equipped.

Foreign Lodging Houses.

These have been regularly inspected during the year and advice and assistance given to Licensees and Owners.

Ice-Cream Shops.

The practice was continued of requiring applicants for licences to make ice-cream to produce a bacteriologically safe product in addition to providing satisfactory premises before the application is approved. The hawking of ice-cream anywhere within the Settlement was prohibited. A few hawkers were caught and dealt with as occasion demanded.

Only sixty-one samples of ice-cream were taken for bacteriological examination from twenty-four factories and shops as compared with seventy-one samples from forty-two premises last year, and one hundred and fifty-one during 1927.

There has been a great increase in the sale of ice-cream in recent years, the manufacture is now mostly in the hands of wholesale dealers who supply it in bulk to retailers. A certain quantity is imported from U.S.A. and Canada, but as the local factories become better equipped the quantity is likely to be reduced.

The bacteriological results of the samples taken are shown in the Table herewith. 26.2% may be classed as unsatisfactory against 26.7% last year. Of the nine samples reported as being unsafe for human consumption two were from Chinese shops and seven from foreign makers.

SPECIMENS OF ICE CREAM TAKEN FOR BACTERIOLOGICAL EXAMINATION.

Class	"A" Good	"B" Fair	"C" Capable of Improvement	"D" Unsatis-factory	"E" Unsafe	Total
Shops and Factories	23	13	9	7	9	61

Markets.

There are 14 Municipal Markets in the Settlement, the same number as last year. Seven are situated in the Eastern District, 4 in the Northern, 1 in the Central District and 2 in the Western District. The Hongkew Market is by far the largest and nearly as much business is done there as in all the others combined. The ideal with respect to the provision of markets would be one large market in each district with a number of smaller ones in well selected positions. A large Municipal Market is required in the Western District having a foreign section to supply the needs of the increasing foreign population of that District. Large markets should be provided with facilities and accommodation for cold-storage of foodstuffs. The system in vogue of stall holders providing their own stalls has many advantages, namely cheapness and mobility. On the other hand, it is often difficult to get the stall holders to keep their stalls clean and in good repair. Many had to be prosecuted for failing to comply with the market regulations in this respect and for the obstruction of passageways, others were prosecuted for selling meat that had not been prepared and passed inspection at the Municipal Slaughterhouse or Slaughterhouses licensed by the Municipal Council, and some for using incorrect weights and scales.

The receipts from market fees amounted to $201,077 as compared with $192,414 for the preceding year, an increase of $8,663. Sinza, Mohawk and Yangtszepoo Markets showed slight decreases. The bigger markets can bear an increase in fees which would produce a much larger revenue. Fees, on the whole, have not been increased for many years.

EASTERN DISTRICT.—There are seven Municipal Markets in this district, two more are required, one in Lower Yangtszepoo where there are many outside hawkers and one off Yuenfong Road and Market Street where an open street market has existed for many years.

Sungpan Road Market in Lower Yangtszepoo is almost fully occupied but with the re-arranging of stalls a few more can be accommodated.

Tsitsihar Road Market has proved difficult to popularise on account of its unsatisfactory position and the large number of hawkers in the neighbourhood, who deprive market stall holders of a certain amount of business. Only about a third of the space is used.

Pingliang Road Market was only opened last year, and all the space was occupied at the time of opening. Later some spaces were given up, but after a time business improved and towards the end of the year all the available space on the ground floor was taken up and arrangements were made for the construction of an upper floor.

Yangtszepoo Market is an old one, small and overcrowded.

Wayside Market is one of the old type of construction but in a good location, with all the space occupied. A few foreigners have box shops and supply general goods.

East Hongkew Market of the old type of construction, and very popular; all the space available has been occupied for some years past. The site is a good one but the construction

poor. This market should be rebuilt with two floors as soon as possible so as to provide additional accommodation and increased revenue.

Wuchow Road Market is a difficult one to keep clean as it is used throughout the day by a number of cooked food dealers. Nearly all the space is occupied.

NORTHERN DISTRICT.—This district is well supplied with Municipal Markets having four, including Hongkew, the largest and most popular of all.

Hongkew Market.—All the space available on the ground and first floors is now occupied whilst the roof of the old portion is also put into use and rented to a Japanese florist. The second floor is now more than half occupied by cooked food dealers who at first objected to using this floor. Space on the ground floor, especially near the sides, is eagerly sought after. In addition to Chinese dealers a considerable number of Japanese have stalls and a number of Russians and other Europeans occupy box shops. It is recommended that the reconstruction of the building be completed. This involves the demolition of the one storey portion and the construction of three storeys to harmonise with the newer part of the market. This would provide much needed accommodation, relieve the present congestion and increase revenue.

Elgin Road Market is an old wooden erection built about 25 years ago and has recently had to be furnished with supports to keep it in position. Reconstruction is recommended as soon as possible. It is very popular and all the space in use except a little at the rear.

North Fokien Road Market is a cement concrete structure of two floors. The location is not a good one, and the market is only about half occupied. Hawkers in this neighbourhood prefer to stand at the mouth of alleyways than take up market spaces.

Purdon Road Market is a small market of cement concrete construction having two floors. There is still some space available on the ground floor and only about half the space on the first floor is taken up. This market has roads on all sides of it, and it is found difficult to keep out loafers during the summer months.

CENTRAL DISTRICT.—The Maloo Market situated at the rear of the Town Hall is the only one at present in the Central District and will be demolished during the forthcoming year. The market was erected during the year 1898 and has supplied the needs of the district for 30 years. The Chinese section has been well used but the Foreign section has been a disappointment and not used to any great extent for years past. A new market to replace the Maloo Market is now under construction at the corner of Chekiang and Foochow Roads. There will be three floors, on the ground floor the sides facing two roads will be lined with shops. Lifts and cold-storage accommodation will be provided. It is doubtful whether this market will be large enough to provide accommodation for all those at present in the Maloo Market and other applicants.

There is no Municipal Market between the Nanking Road and Soochow Creek although there is a small street market in Woo Foo Loong. Another Municipal Market is necessary in that part of the Central District.

WESTERN DISTRICT.—There are only two Municipal Markets in this rapidly growing district. At least four more are required and one of them should be situated at a location convenient for foreign residents.

Sinza Market in Avenue Road is an old low wooden structure much too small for present needs and very much overcrowded. There is no space available in the market. Dealers function on the adjoining streets and alleyways. The site for a new market has been obtained and it is hoped that work on the building will soon be started, for a large modern market is urgently needed in this district.

Mohawk Road Market situated in Taku Road: it is of modern construction of two storeys but about one-third of the space is not yet used.

PRIVATE MARKETS.—There are now four licensed Private Markets in the Settlement, all situated in the Western District, an addition of one during the year, namely the Dah

Zung Market at the corner of Carter and Sinza Roads. The control of Private Markets is not satisfactory and presents considerable difficulty owing to the fact that stall holders are not the licensees. The owner of a Private Market is nominally responsible for the vendors functioning in the market, but in actual practice it is difficult to hold one person responsible for the acts of another. Private Markets interfere with the development of a comprehensive system of Municipal Markets.

MUNICIPAL MARKETS.

MONTHLY AVERAGE NUMBER OF SHOPS, STALLS AND SPACES LICENSED.

WITH TOTAL ANNUAL RECEIPTS.

Market.	*Shops.*	*Stalls.*		*Spaces.*	*Annual*
		$5	*$3*	*$1*	*Receipts.*
Hongkew	1 @ $120, 1 @ $90, 2 @ $25, 16 @ $20	1,223	486	48	$98,275
Maloo	16 @ $15		423	357	22,303
Sinza	—		253	310	12,816
Elgin	—		176	298	9,907
Wayside	1 @ $15, 3 @ $12		211	112	9,538
East Hongkew	—		162	210	8,342
Pingliang Road	—		196	47	7,613
Purdon Road	—		149	122	6,812
Mohawk	—		120	167	6,334
North Fokien Road	—		121	122	5,809
Wuchow Road	—		137	40	5,403
Sungpan Road	—		92	55	3,957
Yangtszepoo	—		46	73	2,521
Tsitsihar Road	—		29	33	1,447
					$201,077

Samples for Bacteriological Examination and Chemical Analysis.

Throughout the year five specimens of Shanghai Waterworks water were taken weekly for bacteriological examination: four from various premises situated at different parts of the Settlement and one from the nearest hydrant to the Waterworks. Results of these examinations are contained in the report of the Pathological Laboratory. The practice has been to take samples from premises near to where roads have been dug up, or where there has otherwise been a possibility of damage to water mains.

In addition to the above, 31 specimens of water from various wells, seven from swimming pools, 30 specimens of ice, 20 of aerated waters and 180 specimens of milk were taken for bacteriological examination.

Samples taken for analysis included 2,063 samples of milk and 157 miscellaneous samples, the latter being mostly Chinese sweetmeats, table butter, margarine and well waters.

Municipal Slaughterhouse.

The year has been a record one for the Municipal Slaughterhouse. The number of animals killed totalled 114,670, or 12,944 more than last year.

Receipts from fees exceeded last year by close on $3,500 and for 1926 by nearly $13,000, amounting to $59,175.45 compared with $55,680.95 last year which was a record.

The supply of cattle from the usual source *via* the Shanghai-Nanking Railway was well maintained throughout the year, though at times a shortage was feared owing to disturbed internal conditions along the line. In April and May the calf butchers ceased to kill for eight days and transferred their business to the French Abattoir on account of a dispute with respect to size and age of calves for classification as veal. During October all the butchers, except the pig butchers, ceased killing for nearly a week in opposition to the introduction by the Municipality of Greater Shanghai of an inspection fee on live animals: eventually the matter was settled by compromise.

As stated in previous reports the existing Slaughterhouse and Cattle-Sheds are hopelessly inadequate. The present Cattle-Sheds have a maximum capacity of 340 oxen, but during the year it was not uncommon for over 500 head of oxen to be on the premises at one time in addition to sheep and calves. In consequence, cattle had to be tethered in the passages adjoining the sheds and this made it impossible to keep the premises in a satisfactory condition.

The need of modern lairage and slaughterhouse accommodation is an urgent necessity in consequence of the remarkable growth of this branch of Municipal activity and to enable the Department to deal with other branches of the work which at present cannot be touched owing to lack of facilities.

There are now 54 butchers on the register against 52 last year.

REJECTIONS AT SLAUGHTER HOUSE.

Cause.	*Oxen.*	*Sheep.*	*Calves.*	*Pigs.*	*Total.*
Tuberculosis	29	0	0	1	30
Emaciation	101	2	3	5	111
Bruising	8	13	1	0	22
Pyaemia	2	0	0	0	2
Fevered	14	0	5	4	23
Swine Fever	0	0	0	163	163
Pneumonia	4	0	0	0	4
Rinderpest	5	0	0	0	5
Peritonitis	2	0	0	0	2
Pericarditis	4	0	0	0	4
Jaundice	2	0	0	0	2
Septic Metritis	4	0	0	0	4
Other Causes	6	1	1	2	10
Total	181	16	10	175	382

SLAUGHTER HOUSE AND CATTLE SHEDS MONTHLY RETURNS FOR THE YEAR 1929.

Months	Killed at Slaughter House.				Rejected at Slaughter House.				Passed for Export from Cattle Sheds.			Rejected at Cattle Sheds.			Receipts.	
	Oxen	Sheep	Calves	Pigs	Oxen	Sheep	Calves	Pigs	Oxen	Sheep	Calves	Oxen	Sheep	Calves	$	cts.
January	3,570	3,253	847	1,282	28	2	0	19	0	0	30	2	0	0	4,704	15
February	2,730	3,232	762	900	14	1	0	20	0	6	39	1	0	2	3,725	55
March	3,265	3,904	957	1,422	17	1	2	34	1	0	0	0	1	0	4,571	30
April	3,158	3,664	810	1,308	10	1	0	26	2	4	0	1	0	0	4,349	90
May	3,276	3,762	803	1,276	9	2	0	16	4	2	0	0	1	1	4,479	70
June	3,409	3,467	906	1,169	17	0	1	5	0	6	0	2	1	0	4,559	40
July	3,702	3,192	880	1,067	16	1	0	8	0	0	1	3	0	4	4,779	10
August	3,935	3,115	902	1,062	25	1	0	1	0	0	0	5	3	0	5,013	45
September	4,296	3,375	848	1,476	12	1	2	2	1	0	45	5	3	0	5,512	95
October	4,119	3,669	1,147	1,733	6	1	1	3	8	0	28	2	3	0	5,559	20
November	4,731	3,810	1,133	2,269	14	2	2	17	0	0	16	3	2	5	6,333	30
December	4,026	3,768	677	2,606	13	3	2	24	0	0	18	0	0	0	5,587	45
Total	44,217	42,211	10,672	17,570	181	16	10	175	16	18	177	24	14	12	59,175	45
1928	43,153	35,035	10,607	12,931	220	18	14	118	54	40	254	18	11	33	55,680	95
1927	40,133	36,827	9,375	13,428	295	22	11	86	13	16	4	13	30	21	52,563	10
1926	35,526	34,381	8,560	9,927	320	38	6	52	22	12	5	25	19	26	46,300	95

RETAIL PRICES OF SOME OF THE MOST COMMON DOMESTIC ARTICLES.

AVERAGE PRICES FOR 1929 COMPARED WITH 1919.

Article.	*Quantity.*	*Average Price. 1929.*	*1919.*	*Increase. Cents.*	*Increase. per cent.*
Beef (sirloin)	per lb.	$-30	$-19	11	57.8%
Mutton (leg)	„	30	20	10	50%
Pork (chop)	„	40	25	15	60%
Mandarin (fish)	„	51	30	21	70%
Samli „	„	83	39	44	112.8%
Pheasant	each	83	50	33	66%
Wild Duck	„	53	35	18	51.3%
Snipe	„	17	15	2	13.3%
Eggs	per doz.	39	19	20	105.3%
Fowl	per lb.	39	20	19	95%
Duck	each	1.15	62	53	85.4%
Bananas	per lb.	9	7	2	28.6%
Oranges	„	21	11	10	90.9%
Pumeloes	each	24	20	4	20%
Peaches	per lb.	15	10	5	50%
Onions	„	5	6	Dec. 1	—
French Beans	„	12	9	3	33.3%
Green Peas	„	12	9	3	33.3%
Tomatoes	„	9	9	—	—
Potatoes	per picul	3.18	2.32	86	37%
Milk (foreign dairies)	per bottle	25	20	5	25%
Milk (Chinese dairies)	„	20	17	3	17.6%
Flour (American)	per 50 lbs.	5.50	4.00	1.50	37.5%
Flour (Chinese)	„	3.22	2.29	93	40.6%
Rice (No. 1 Quality)	per 200 lbs.	14.30	7.48	6.82	91%
Barley	per 114 „	4.86	2.65	2.21	83.4%
Bran	„	3.49	2.27	1.22	53.7%
Exchange (on demand)	Tls.	2/4 13/16	5/6½	3/1 11/16	

Pig Inspection and Private Pig Slaughterhouses.

The examination of pigs killed for Chinese consumption at the four Private Pig Slaughterhouses commenced on November 1, 1928. This is therefore the first complete year of working. The slaughtering is done at night, and four Foreign Inspectors are employed on inspection duties. The premises are now in a much more satisfactory condition than when first licensed. Defective floors and drains have been repaired, additional lighting installed, more hanging accommodation provided, and improvements in cleansing and offal removal effected. Further improvements are necessary in the form of additional lairage accommodation and inspection facilities.

The live pigs are brought in from the hongs and other sources during the day, slaughtered at night and the carcases removed to markets and shops early in the morning. Those fit for human consumption are stamped with a triangular stamp and those unfit are stamped with a special rejection stamp marked "R." The ultimate disposal of rejected carcases and organs is not yet altogether satisfactory. A few are boiled down at the Slaughterhouse, but most are taken away to the owner's shop for melting down and fat recovery. Before this inspection work commenced it was said that only about 600 pigs were killed daily at these Private Pig Slaughterhouses, but the average daily number killed at the four places during the year was 1,237. The biggest kills were just previous to Chinese New Year Holidays when on one day 2,497 were slaughtered.

A fee of 10 cents is charged for each pig inspected; the receipts from fees amounted to $45,167.60, an average of $123.70 per day.

In the Yangtszepoo District pigs were formerly killed in private houses and in insanitary mud huts and mat sheds. It was decided to erect a small Municipal Pig Slaughterhouse. This building was opened for use in January of this year. At first the

pig butchers were slow in using the place but soon saw the advantage of a good building with proper facilities for their work. During the first month only 594 pigs were killed, but during the month of September 2,868 were slaughtered. The premises as originally constructed were found too small and were subsequently enlarged by lengthening the killing hall and providing additional lairage accommodation. Altogether 24,725 pigs were killed and inspected. The total receipts amounted to $7,417.50.

FOOD, DAIRIES AND MARKETS DIVISION—GENERAL SUMMARY.

Defective drainage amended	108
Insanitary wells abolished	1
Proper water supply provided	108
Complaints of insanitary conditions received from the Public	58
Insanitary conditions reported by the Department	17,123
Departmental Notices Issued	292
Written intimations issued	402
Second written intimations issued	0
Notices of intention to proceed served	0
Samples taken for analysis	2,161
Samples taken for bacteriological examination	605
Pounds of unsound food destroyed	147,656
Food prosecutions	2,139
Licence applications received and dealt with	1,500

FOOD, DAIRIES AND MARKETS DIVISION.
PROSECUTIONS.

Offence	Number	Penalty
Breach of Market Regulations	134	Fined $0.30—$20
„ „ Private Market Licence Conditions	61	„ $1.00—$10
„ „ Bakery Licence Conditions	10	„ $2.00—$10
„ „ Dairy Licence Conditions	18	„ $2.00—$100
„ „ Foreign Food Shop Licence Conditions	8	„ $2.00—$10
„ „ Chinese Food Shop Licence Conditions	193	„ $2.00—$50
„ „ Fruit Shop Licence Conditions	80	„ $2.00—$10
„ „ Hotel Licence Conditions	3	„ $10.00—$50
„ „ Restaurant Licence Conditions	1	„ $10.00
„ „ Tea Shop Licence Conditions	1	„ $2.00
„ „ Bye-law XXXIV—Selling Foodstuffs without a Licence	1,630	„ $0.20—$100
TOTAL	2,139	

FOOD, DAIRIES & MARKETS DIVISION: FOOD PREMISES, 1929.

Aerated Water Factories	4
Bakeries	73
Dairies	29
Chinese Eating Houses	805
Chinese Food shop—off licence	2,304
Foreign Food Shops No. 1	34
Foreign Food Shops No. 2	121
Fruit Shops and Stalls	261
Hotels	36
Foreign Lodging Houses	150
Ice Factories	12
Ice Shops	5
Markets—Municipal	14
Markets—Private	4
Restaurants—with alcoholic drinks	66
Restaurants—without alcoholic drinks	108
Slaughterhouses—Municipal	2
Slaughterhouses—Private	4
Taverns	20
Total	4,052

VIII.—CEMETERIES.

HUNGJAO ROAD CEMETERY.—There were altogether 198 burials of which 48 were First Class, 92 Second Class, and 58 of Paupers. Six of the First Class were of Christian Chinese, and fourteen of members of Military and Naval Forces.

Paupers.—The portion of "G" Section set aside for pauper burials in 1927 is nearly full, and provision for 60 spaces will be made in the Pahsienjao Cemetery by removing two small paths in the old Pauper Section, and utilizing a strip of land running along the Western boundary. This will be ready early in 1930.

BUBBLING WELL CEMETERY.—There were 100 burials of which 60 were First Class, 33 Second Class, including eight still-born infants, and seven of indigent Foreigners.

Additional Grave Spaces.—A strip of land bordering the Western boundary of the Cemetery opened as First Class ground is now fully taken up with the exception of 11 reserved spaces.

Chapel.—Three ceiling fans were installed and the Chapel mosquito-proofed by the authorities of the Holy Trinity Cathedral.

Crematorium.—Altogether 27 cremations were carried out during the year. The apparatus worked satisfactorily.

New Boundary Wall.—The wooden fencing on the Northern boundary of the Cemetery was replaced by a brick wall.

PAHSIENJAO CEMETERY.—There were 16 First Class, 6 Second Class, and 2 Pauper burials (children) during the year.

SHANTUNG ROAD CEMETERY.—Due care and attention was given to this Cemetery where rests the remains of the earliest residents of the Foreign Settlement.

POOTUNG CEMETERY.—The general condition of this Cemetery was fairly well maintained though some difficulty was experienced in excluding beggars.

SOLDIERS CEMETERY.—This Cemetery, which holds the mortal remains of those British Soldiers who died in the early strenuous years of the history of the Settlement, 1862–1865, during the Taiping rebellion, has been maintained in proper order. A high boundary wall is badly needed. Advertisement hoardings were again erected in front of the Cemetery during June, a deplorable act of desecration. The matter is again under negotiation between the Chinese authorities and H.M. Consul-General.

GARDENING WORK AT MUNICIPAL CEMETERIES.—The Public Health Department took over this work from the Public Works Department (Parks and Open Spaces) from January 1929.

CEMETERIES.

(Statistics.)

	Year Opened	Year Closed	Total Burials	Burials 1929	Spaces Available			
					Reserved Class		Unreserved Class	
					1st	2nd	1st	2nd
Soldiers	1862	1865	305	Closed				
Pootung	1859	1904	1783	Closed				
Shantung Road	1841	1871	469	Closed				
Pahsienjao	1869		3658	24	366	54		
Bubbling Well	1898		4889 and 565 Cremations.	100 and 27 Cremations	558	56		
Hungjao Road	1926		574	198	45	0	761	425

PUBLIC MORTUARY.

Month	Foreign Bodies	Chinese Bodies	Autopsies	Inquests
January	4	47	2	39
February	3	52	4	40
March	6	44	6	47
April	9	54	6	47
May	4	66	3	53
June	5	57	2	51
July	8	61	5	67
August	5	61	5	61
September	3	67	2	66
October	4	66	6	65
November	9	52	5	55
December	7	50	3	43
Totals ..	67	677	49	634

C. NOEL DAVIS,
Commissioner of Public Health.

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